Environmental and Social Monitoring Report

Project Number: 41924-014
January 2015

Nam Ngiep 1 Hydropower Project
(Lao People's Democratic Republic)

Quarterly Monitoring Report 2014 – Q4 Environmental

Prepared by Nam Ngiep 1 Power Company Limited for the Asian Development Bank

Nam Ngiep1 Hydropower Project

Quarterly Monitoring Report 2014_Q4

(as of 1st January 2015)

Environment Management Office

January 2015

Nam Ngiep 1 Power Company Limited

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Accessibility

☐ Public

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Document No.

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ABBREVIATIONS / ACRONYMS

AD	Administration Division
ADB	Asian Development Bank
ARCAP	Audit Report and Corrective Action Plan
BODM	Board of Directors Meeting
BOQ	Bill of Quantity
CA	Concession Agreement between the NNP1PC and GOL,
CAP	Corrective Action Plan
COD	Commercial Operation Date
	Chemical Oxygen Demand (in environmental terms)
CV	Curriculum Vitae
CVC	Conventional Vibrated Concrete
CWC	Civil Works Contract
CTA	Common Terms Agreement
DAS	Document Approval Sheet
DEB	Department of Energy Business, MEM
DEPP	Department of Energy Policy and Planning, MEM
DESIA	Department of Environmental and Social Impact Assessment, MONRE
DFRM	Department of Forest Resources Management, MONRE
DGC	District Grievance Committee
DL	Distribution Line
DO	Dissolved Oxygen
DSRP	Dam Safety Review Panel
EC	Electrolytic Conductivity
ECOCD	EGAT Construction Obligation Commencement Date
ECZ	Elephant Conservation Zone
EDL	Electricite du Laos
EDL PPA	Power Purchase Agreement between NNP1PC and EDL
EGAT	Electricity Generating Authority of Thailand
EGATi	EGAT International Company Limited
EIA	Environmental Impact Assessment
EL	Elevation (in surveying terms, vertical position as height above a datum)
EMO	Environmental Management Office
EMU	Environmental Monitoring Unit
EMWC	Electrical-Mechanical Works Contract
EPF	Environmental Protection Fund
ESMMP	Environmental and Social Monitoring and Management Plan
FAD	Finance and Accounting Division
FC	Financial Close
FCD	Financial Close Date (as defined in the EGAT PPA)

FI	Fire Incident
FY	Fiscal Year
GOL	Government of Lao PDR.
HMWC	Hydraulic Metal Works Contract
HR	Human Resources
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IMA	Independent Monitoring Agency
ISP	Integrated Spatial Planning
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KANSAI	Kansai Electric Power Company Incorporated
km	kilometre
KPN	KPIC Netherlands B.V.
kV	kilo-Volt
LACP	Land Acquisition and Compensation Plan
LHSE	Lao Holding State Enterprise
LMP	Labour Management Plan
LNTP	Limited Notice to Proceed (under each construction Contract)
LTA	Lender's Technical Advisor
LTI	Lost Time Incident
M	million
m	meter
MEM	Ministry of Energy and Mines, Lao PDR
MOF	Ministry of Finance, Lao PDR
MOFA	Ministry of Foreign Affairs, Lao PDR
MOM	Minutes of Meeting
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MOU	Memorandum of Understanding
MVI	Motor Vehicle Incident
NBCA	National Biodiversity Conservation Area
NCI	Non-Compliance Issue
NCR	Non-Compliance Report
NN2	Nam Ngum 2 Power Company Limited
NNP1PC	Nam Ngiep 1 Power Company Limited
NPA	Non-Profit Association
NPF	National Protection Forest
NT2	Nam Theun 2 Hydropower Project
NTP	Notice to Proceed (under each construction contract)
OC	Obayashi Corporation

ORP	Oxidation Reduction Potential
PAP	Project Affected People
PD	Property Damage
PHAP	Public Health Action Plan
PPA	Power Purchase Agreement (between NNP1PC and EGAT)
PONRE	Provincial Department of Natural Resource and Environment, MONRE
PRLRC	Provincial Resettlement and Livelihood Restoration Committee
PvPA	Provincial Protection Area
RCC	Roller Compacted Concrete
REDP	Resettlement and Ethnic Development Plan
RI	Recordable Injury
RMU	Resettlement Management Unit
ROW	Right of Way
SBLC	Stand-by Letter of Credit
SCOD	Scheduled Commercial Operation Date (as defined in EGAT PPA)
SFCD	Scheduled Financial Close Date (as defined in EGAT PPA)
SHM	Shareholders Meeting
SMO	Social Management Office
SSESMMP	Site Specific Environmental and Social Monitoring and Management Plan
STA	Station (in surveying terms, plan or horizontal position measured from a datum)
STD	Sexually Transmitted Disease
TD	Technical Division
TEXIM	Export-Import Bank of Thailand
THB	Thai Baht
TLWC	Transmission Line Works Contract
TOR	Terms of Reference
TSS	Total Suspended Solids
USD	US Dollar
UXO	Unexploded Ordinance
VO	Variation Order
WMC	Watershed Management Committee

EXECUTIVE SUMMARY

Construction of the project started in December 2013 and initially the Technical Department (TD) of the NNP1 took the leading role in working with the main contractor, Obayashi Corporation, in establishing working procedures and protocols relating to environmental management. Between February and October 2014 the Environmental Management Office (EMO) of the NNP1 grew from 10 to 36 staff. Over that same period staff focus was on two key aspects: 1) completing the environmental and social documents of the project to ADB Safeguard Policy standards - to achieve Financial Close; and 2) establishing compliance operating procedures for contractor management, along with environmental monitoring programs within the project footprint and Nam Ngiep watershed. October to December 2014 was a settling phase, and the opportunity for new staff to familiarize themselves with new business procedures, the requirements of the project Concession Agreement, expectations of project lenders and company shareholders.

The relatively late establishment of the EMO resulted in it having to 'catch up' with the construction schedule. In the 1st half of 2014 three worker camps were already operating and good progress was being made on the main access road construction. As 2014 progressed, and particularly with the establishment of the environmental monitoring team, it was observed that environmental sensitive design of camps and infrastructure were not well applied, or not applied at all. Of note, was the discharge of polluted water from worker camps, which indicated waste water treatment systems were clearly not functioning, and struggling further under wet season conditions. Polluted discharge water, poor hazardous waste management practices at site workshops, and unmanaged domestic solid waste at worker camps took up the bulk of the 30 Non Compliance Reports issued over the period August to December 2014.

Trying to resolve issues caused environmentally insensitive design and poor practices was further complicated by the contractors own limited capacity within their environmental and social department. By the late 2nd half of 2014, the main contractors environment and social management team consisted of one Environmental Specialist and one Environment and Safety Officer. Sub contractors do not have trained environmental specialist working on site. By enlarge for 2014, the contractors site engineers and sub-contractor managers assumed most of the responsibility for addressing environmental and social issues, with NNP1 supporting gaps in relation to planning and monitoring.

The Biodiversity Offsets Framework was work-in-progress with shuttle discussion occurring between the ADB and the NNP1 EMO through out the latter part of 2014. Unfortunately, the report version submitted at the close of 2014 did not meet the satisfaction of the ADB Environmental Safeguards Committee, and a deadline extension was offered to NNP1. Also, the important Biodiversity Baselines Survey of the Nam Ngiep Watershed, which would identify potential biodiversity assets that require offsetting, was not implemented due to slow internal procedures. This survey work is expected to start in the 1st Quarter of 2015, as is the completion of the revised Biodiversity Offsets Framework.

Never the less, good progress was made in establishing various government entities that would manage the roll-out of the Watershed Management Programs and the Biodiversity Management Programs. Watershed Management Committees were established in the two main provinces of Bolikhamxay and Xaysomboun.

Watershed management planning was advanced by the NNP1 through consultations with 48 villages in the watershed. The consultation was to introduce the company; inform villages of the company's need for them to conserve local natural resources; and advise that the company would support their conservation endeavours. The villages were informed that the consultation meetings would be the start of a long dialogue between them, the government and the company.

1 BACKGROUND

This document is the quarterly environmental safeguard report of the Nam Ngiep 1 Hydropower Project in Lao PDR, prepared by the company's Environmental Management Office (EMO). It provides a summary of the results for environmental management, mitigations and monitoring during the five months August to December 2014. This is the first quartely report following the signing of the Asian Development Bank (ADB) Facility Agreement in August 2014.

The Project is a signatory of, and committed to the requirements of the ADB Safeguard Policy Statement (June, 2009). Key safeguards relevant to environmental management of the project include but not limited to the following:

1. The NNP1 will identify measures to *avoid, minimize, or mitigate* potentially adverse impacts and risks.
2. During the design, construction, and operation of the project the NNP1 will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards.
3. The NNP1 will monitor and measure the progress of implementation of the EMP/EMMP-CP, commensurate with the project's risks and impacts.
4. The NNP1 will carry out meaningful consultation with affected people and other concerned stakeholders.

According to the Projects Facility Agreement with ADB, the project is obligated to report quarterly on progress of the project and the application of it's safeguards (social and environmental), and that the subsequent reports are publically disclosed (on the ADB website) in line with the banks Public Communications Policy.

2 PROJECT OVERVIEW

The Nam Ngiep river originates in the mountains of Xieng Khouang Province, flowing through Khoun District into Thathom District of Xaysomboun Province, through Hom District and into Bolikhan District of Bolikhamxay Province. The Nam Ngiep (*nam* is the Lao word for river) meets the Mekong River just upstream from Pakxan city in Bolikhamxay Province.

The project will consist of two dams on the Nam Ngiep. The main dam, 9.0 km upstream of Hat Gnuin Village in Bolikhan District, and will create a 70-km-long, narrow reservoir that extends up the Ngiep Valley as far as Thathom District. At almost 150 m high, the main dam will be the second largest in Laos. The Power Station at this dam will generate up to 272 MW of electricity for export to Thailand.

Approximately 6.0 km below the main dam a 20 m high re-regulation dam will control water flows to avoid sudden large releases of water to the river downstream. A second power station at this re-regulation dam will be able to produce around 18 MW of power for sale to the national utility, Electricité du Laos (EDL).

With a combined capacity of 290 MW, Nam Ngiep 1 will generate around 1,620 GWh of electricity annually. Two transmission lines will be required to transport the electricity generated by the project. From the main power station a 230-kV line will run for 125 km to the Nabong outside Vientiane. A 115-kV transmission line will be constructed by EDL from the Re-regulation Power Station to Pakxan, over a distance of 40 km.

2.1 CONSTRUCTION PROGRESS DURING THE REPORTING PERIOD

Main construction activities and progress during and prior to the period August to December 2014 includes the following facilities:

i. Access Roads
ii. Quarry
iii. Spoil Disposal Areas (Permanent)
iv. Main dam
v. Regulation Dam
vi. Regulation Dam River Diversion
vii. Worker Camps
viii. 22kV Power Supply

Table 1 Construction site locations and status as of December 2014.

Category	Site ID	Site Name	Construction Status
1	**Access Road**		
1.1	*JR*	*JICA Road*	Closed.
1.2	A1	Road A	Stabilization and drainage improvements.
1.3	P1	Road P1	Stabilization and drainage improvements.
1.4	P2	Road P2	Stabilization and drainage improvements.
1.5	T1	Road T1	Operating
1.6	T2	Road T2	Operating
1.7	T3	Road T3	Not commenced
1.8	T4	Road T4	Initial survey and site clearing.
1.9	T5	Road T5	Operating
1.10	T6	Road T6	Not commenced.
1.11	T7	Road T7	Operating
1.12	T8	Road T8	Excavation and embankment work ongoing.
1.13	T9	Road T9	Excavation and embankment work ongoing.
1.14	T10	Road T10	Excavation and embankment work ongoing.

Category	Site ID	Site Name	Construction Status
1.15	T11	Road T11	Excavation and embankment work ongoing.
1.16	T12	Road T12	Closed
1.17	T13	Road T13	Operating
2	**Worker Camp**		
2.1	PKC_C	PKC Camp	Operating
2.2	MVDC_C	MV-DC Camp	Operating, preparing schedule for demobilization
2.3	TCM_C	TCM Camp	Operating
2.4	SECC_C	SECC Camp	-
2.5	LS_C	Lamsay Camp	-
2.7	OC_C	Contractor Camp	Under construction
2.8	NP1_C	Owners Base Camp	Under construction
2.9	V&K_C	V&K Camp	Operating
2.10	SH_C	Sinno Hydro Camp	Operating
2.11	PAKC-C	Pang-Onkham Camp	Operating
3	**Spoil Disposal Area**		
3.1	SD1	Spoil Disposal Area 1	Developed for RT and Songda
3.2	SD2	Spoil Disposal Area 2	Operating
3.3	SD3	Spoil Disposal Area 3	Operating
3.4	SD4	Spoil Disposal Area 4	On-hold
3.5	SD5	Spoil Disposal Area 5	On-hold
3.6	SD6	Spoil Disposal Area 6	Operating
3.7	SD7	Spoil Disposal Area 7	Operating
3.8	SD7	Spoil Disposal Area 8	Developed for Sino-Hydro camp
4	**Borrow Pit**		
4.1	B1	Borrow Pit 1	-
4.2	B2	Borrow Pit 2	-
4.3	B3	Borrow Pit 3	-
5	**Quarry Site**		
5.1	TQ	Temporary Quarry (A1 Rd; st: 4+900)	On stand-down.
5.2	MQ	Main Quarry	Vegetation clearing and earth works.
6	**Construction Site**		
6.1	*TB*	Temporary Bridge	Completed
6.2	*MD*	Main dam	Earthworks ongoing
6.3	DT	Diversion Tunnel	Construction on-going
6.4	*RD*	Re-regulation dam	Construction on-going
7	**Industrial Area**		
7.1	CVC	Conventional Vibration Concrete Plant	Operating
7.2	RCC	Rolling Compacted Concrete Plant	Clearing and Earth work completed
7.3	AP	Aggregate Plant Yard	Structure installation
7.4	RT's IA	RT's Industrial Area	Operating
7.5	Songda	Songda's Workshop	Operating
8	**Transmission Line**		
8.1	PS_22kV	Power supply 22kV Line	Construction on-going.
8.2	TL_230 kV	Transmission Line 230kV Line	Alignment survey.
8.3	TL_150kV	Transmission Line 150kV Line	No activity

2.1.1 Access Roads

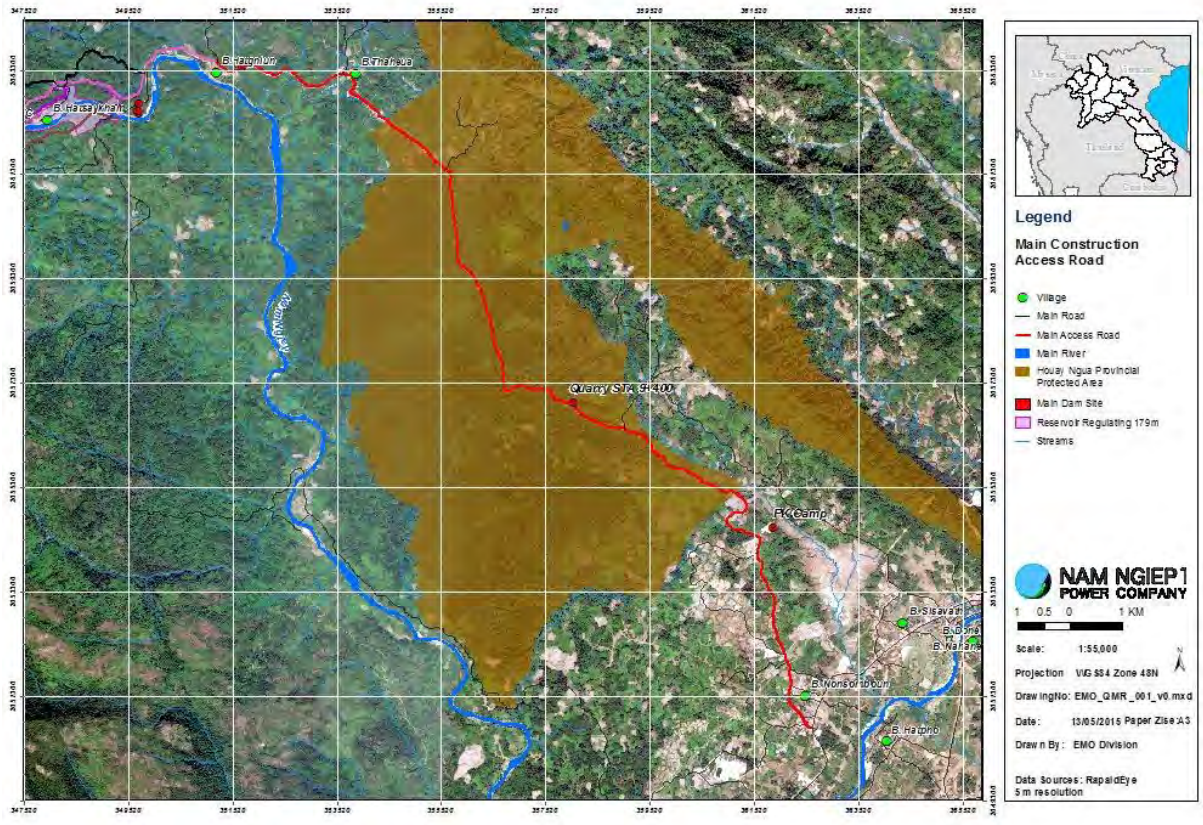
Construction of the access roads was the only site activity prior to August 2014.

The main project access road links Ban Nonsomboun, Bolikhamxay Province, to the dam site, a distance of 52km. This is an existing road subject to upgrades to improve drainage and hauling capacity. Upgrade of the main access road commenced in December 2013, and by December 2014 was 86% completed.

This main access road dissects a section of the Houay Ngua Provincial Protected Area (PPA), in Bolikhan District for a distance of approximately 9km. The main access road also passes through the three village settlement of Nonsomboun, Hatgnuin, and Thahuaer, and passes nearby to Ban Hatxaykam before reaching the dam site.

At the dam site there are 13 planned temporary roads that link construction facilities, at various stages of construction or completion. Overall, 70% of their construction was completed.

Figure 1 Main Project Access Road - Ban Nonsomboun to Dam site



2.1.2 Quarry (STA9+400)

A quarry was developed at 9.4km along the main access road in the vicinity of the Houay Ngua Provincial Protected Area. Clearing involved around 2ha, and the quarry has an

expected win capacity of 51,000m^3. The quarry will be decommissioned at the conclusion of main access road construction. Refer to Figure 1.

2.1.3 Spoil Disposal Areas (Permanent)

Along the main access road to the dam (Left Bank) from STA 24+700 to STA29+600 there were six permanent spoil disposal areas of between 53,510m^3 to 372,918m^3 capacity being prepared, and at various stages of construction. Spoil Area perpetration includes vegetation clearing, earth works, slope protection and drainage installation. Spoil Areas on the left bank include numbers 1, 2, 3, 4, 5, 8 and New Area (represented by the triangle in Figure 2).

On the right river bank two Spoil Areas (6 and 7) were being prepared.

Figure 2 Left bank Spoil Disposal Area

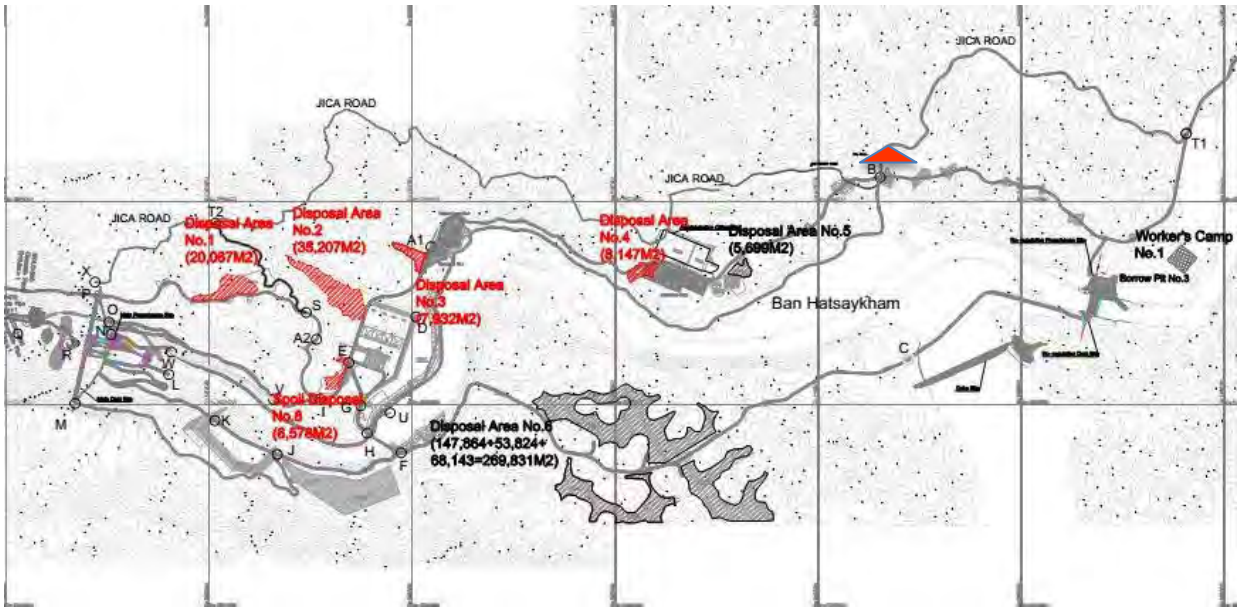
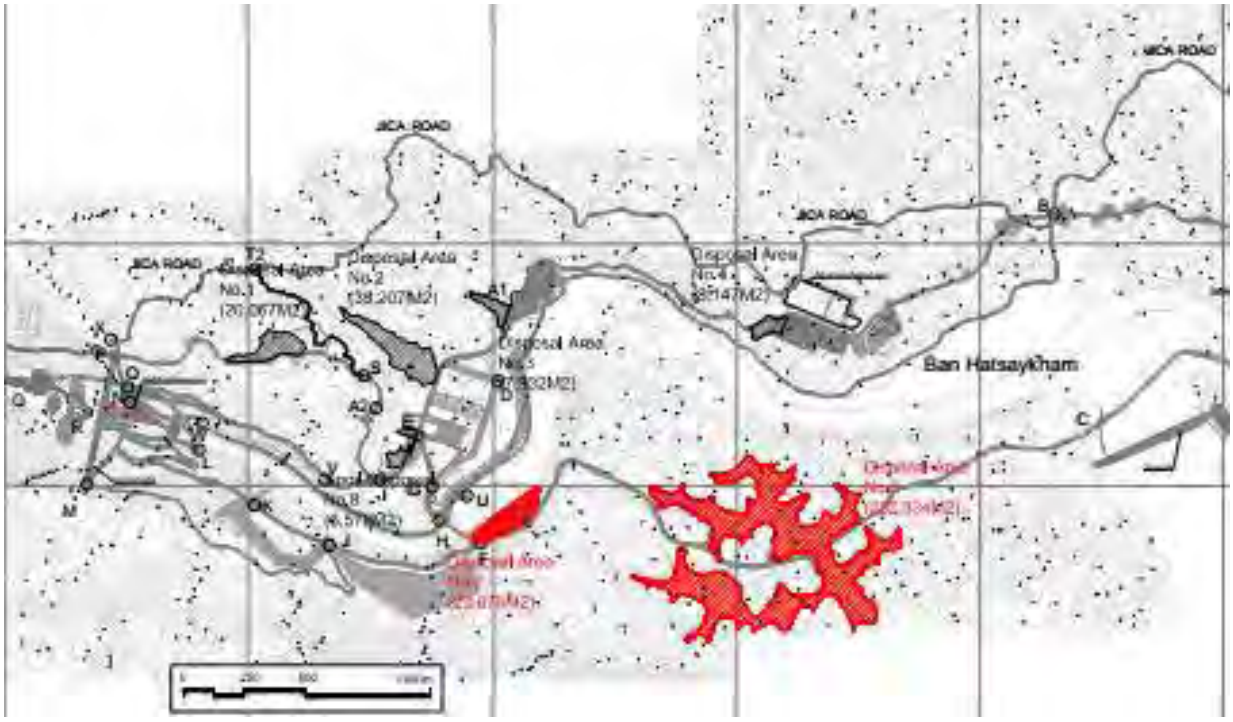


Figure 3 Right bank Spoil Disposal Areas



2.1.4 Main dam

The main dam is located 6km upstream from the regulation dam. At the conclusion of the reporting period reporting period 3% of body works, and 12% of vegetation clearing and earth works were completed. Refer completed. Refer to

Figure 5.

2.1.5 Regulation Dam

Vegetation clearing and preliminary earth works (basic site preparation) commenced in February 2014, but was then suspended for the wet season. Work recommenced in October and by December 2014 10% of the excavation was completed, along with 7% of the regulation dam river diversion levee. Work on the regulation dam commences on the left bank with the construction of the river diversion levee, and then excavation into the river bed behind the levee for the construction of the regulation dam power station.

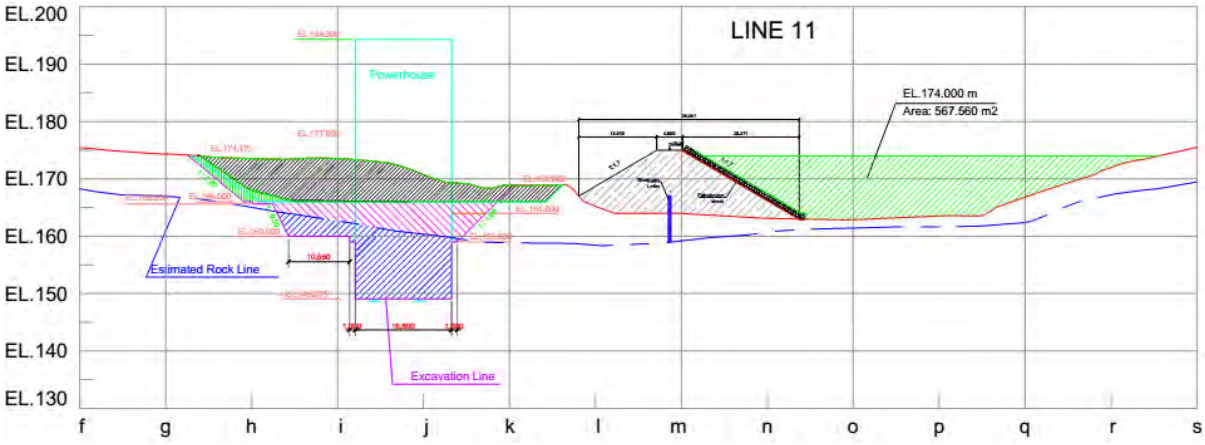
Photo 1 Series taken of left bank excavations at the regulation dam site

Site conditions of the left bank (background) prior to construction

Left bank view downstream

Left bank view upstream

Figure 4 Excavation profile into the Nam Ngiep river bed for regulation dam power house, and river diversion levee



2.1.6 Worker Camps

By the conclusion of the reporting period seven worker camps were operating or under construction. The following is a list of Company Camps and worker numbers.

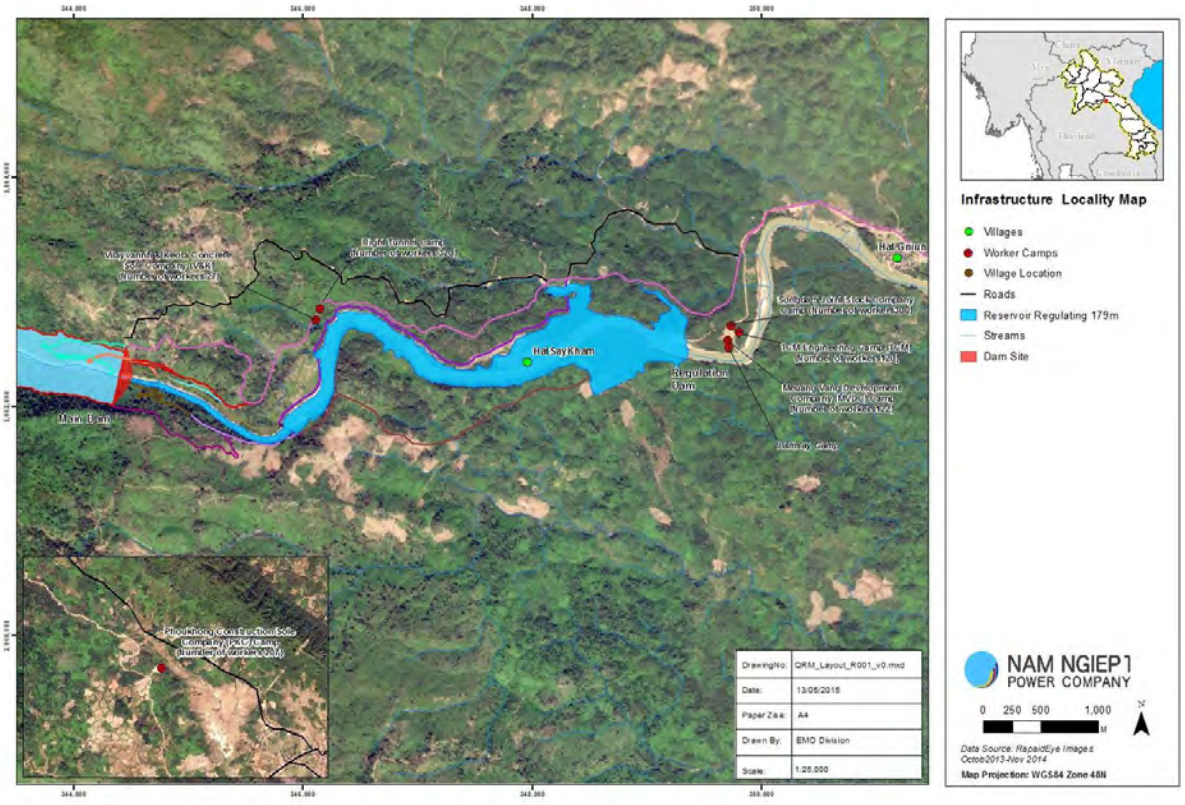
Table 2 Sub-contractor camps on site

	Company	Number of workers
1	Meuang Vang Development Company (MVDC) Camp	122
2	Phoukhong Construction Sole Company (PKC) Camp;	207

3	TCM Engineering Camp (TCM)	120
4	Vilayvannh & Keota Concrete Sole Company (V&K)	27
5	Songda 5 Joint Stock Company Camp.	300
6	Right Tunnel Camp	320
7	Lamsay	16

In addition to the worker camps, construction of the Main Contractor Camp was 13% completed, and the Owners Camp was 19% completed. Refer to Table 12 for a complete list of related contract works.

Figure 5 Worker Camp locations



2.1.7 Power Supply (22kV TL)

The project requires an enhanced electrical power supply and an extension of the existing transmission line to provide adequate power for activities associated with construction, and to provide electricity to the proposed Ban Houay Soup resettlement village. The entire length of the upgrade is 59.4km and consists of the following sections:

1. Upgrade of the existing Electricite du Lao (EDL) 22 kV line from Paksan Substation to Ban Nonsomboun (20.8 km) and from Nonsomboun to Ban Hatsaykham (27.8 km) – through the Houay Ngua Provincial Protected Area (PPA);
2. Construction of NN1 HPP 22 kV lines from Ban Hatsaykham to the RCC plant yard and Re-regulation Dam (4.9 km) and from the RCC plant yard to the Main Dam and Quarry Sites (3.1 km);
3. Construction of a 22 kV distribution line (2.8 km) from the NN1 HPP Re-Regulation Dam to Ban Houay Soup resettlement village.

The route uses mostly the existing EDL 22kV ROW from Paksan to Ban Hatsaykam at which point it is extended to various construction sites. The construction of the 22kV supply was 100% completed by December 2014.

2.1.8 Related to vegetation clearing

Prior to vegetation clearing all work areas are pegged to mark site area boundaries. Trees of commercial value are stockpiled for later GOL removal. Scrub and ground cover layers are stockpiled (windrowed) and burnt away from sensitive areas. In the case of access roads, trees of conservation significance are identified via a survey, and were possible, new alignments are selected to avoid such areas. Trees of conservation value are then labeled (in Lao Language). Windrowed trees for burning are placed at least 20m back from pegged boundary areas.

2.1.9 Related to temporary soil stock piles

Temporary soil disposal areas are required for most construction sites. The material is later transferred to a permanent spoil area, or used as filling or top soil at the point of excavation. All temporary soil stock piles are marked as such. As required, temporary soil stock piles, those only required for up to two weeks (less duration during wet season), are located at least 20m from waterways, and large drainage lines.

2.2 CONTRACTOR COMPLIANCE MONITORING

2.2.1 Contractor Site Specific Environmental and Social Management and Monitoring Plans

Since issuance of the Notice to Proceed in October 2014 to the Main Contractor, environment and social management has been monitored and managed by one Environmental Specialist and one Environment and Safety Officer employed by the

Contractor. These work in consultation with Main Contractor site engineers and sub-contractor managers. NNP1 supports gaps in the current structure of the main contractor environment and social department.

Environmental monitoring of construction activities is critical to identify potential or actual non-compliance issues that require corrective actions. These are the sites currently being monitored by EMO Compliance Inspection team. Only the Civil Works Contractor, Obayashi Corporation was operating on site to December 2014.

Under the Owners EMP, NNP1 is required to review the contractor Site Specific Environmental Management and Monitoring Plans (SS ESMMP) to determine if sufficient preparation and planning has gone into managing anticipated environmental and social impacts of each construction site. Generally, two SS ESMMPs are required for each site: 1) Vegetation Clearing and Earth Works, and 2) Main Body Construction. Once NNP1 is satisfied and the SS ESMMP is approved, works can proceed.

Once construction commences the NNP1 assess the compliance to mitigations outlined in the SS ESMMPs against 18 thematic areas, or sub plans. SS ESMMPs provide the necessary detail on what the contractor will do to avoid, minimize or mitigate against the social and environmental impacts of each thematic area.

Table 3 Thematic Areas (sub-plans) of SS ESMMP

SP01: Erosion and Sediment Control
SP02: Water Availability and Pollution Control
SP03: Emission and Dust Control
SP04: Noise and Vibration
SP05: Waste Management
SP06: Hazardous Material Management
SP07: Vegetation Clearing
SP08: Landscaping and Re-vegetation
SP09: Biodiversity Management
SP10: Spoil Disposal
SP11: Quarry and Construction Layout
SP12: Unexploded Ordnance (UXO) Survey and Disposal
SP13: Construction of Work Camps
SP14: Traffic and Access
SP15: Training and Awareness
SP16: Project Personnel Health Program
SP17: Emergency Preparedness
SP18: Cultural Resources

2.3 CONTRACTOR SS ESMMP APPROVALS

Thirty-six (36) SS ESMMPs were submitted for review and approval up to December 31st 2014. Refer to Table 4

Table 4 SS ESMMPs submitted by the contractor

No.	List of SS ESMMPs	Date approved by NNP1/EMO	Pending NNP1 Approval
1	Site-Specific ESMMP-CP for		X

No.	List of SS ESMMPs	Date approved by NNP1/EMO	Pending NNP1 Approval
	A Road		
2	Site-Specific ESMMP-CP for P1 Road		X
3	Site-Specific ESMMP-CP for P2 Road		X
4	Site-Specific ESMMP-CP for T1 Road		X
5	Site-Specific ESMMP-CP for T2 Road		X
6	Site-Specific ESMMP-CP for T3 Road		X
7	Site-Specific ESMMP-CP for T4 Road		X
8	Site-Specific ESMMP-CP for T5 Road	Febuary-2014	
9	Site-Specific ESMMP-CP for T7 Road	28-Jul-14	
10	Site-Specific ESMMP-CP for T8 Road	17-Dec-14	
11	Site-Specific ESMMP-CP for T9 Road		X
12	Site-Specific ESMMP-CP for T10 Road	25-Nov-14	
13	Site-Specific ESMMP-CP for T11 Road	1-Oct-14	
14	Site-Specific ESMMP-CP for T12 Road	24-Dec-13	
15	Site Specific ESMMP for T13 Road		X
16	Site-Specific ESMMP-CP for Quarry STA.9+400	20-Mar-14	
17	Site-Specific ESMMP-CP for Stock Yard		X
18	Site-Specific ESMMP-CP for Disposal Area	15-Oct-14	
19	Site-Specific ESMMP-CP for Temporary Bridge	20-Mar-14	
20	Site-Specific ESMMP-CP for Plant Yard	21-May-14	
21	Site-Specific ESMMP-CP for earthworks of Aggregate Plant	3-Sep-14	
22	Site-Specific ESMMP-CP for Excavation for inlet and outlet	8-Sep-14	
23	Site-Specific ESMMP-CP for CVC Plant	2-Sep-14	
24	Site-Specific ESMMP-CP for Construction main dam	10-Sep-14	
25	Site-Specific ESMMP-CP for River Diversion Tunnel Work	26-Sep-14	
26	Site-Specific ESMMP-CP for	2-Sep-14	

No.	List of SS ESMMPs	Date approved by NNP1/EMO	Pending NNP1 Approval
	Re-regulation power station		
27	Site-Specific ESMMP-CP for Power Supply System	14-Aug-14	
28	Site-Specific ESMMP-CP for Quarry site	11-Nov-14	
29	Site-Specific ESMMP-CP for River Diversion structure works	25-Nov-14	
30	Site-Specific ESMMP-CP for Aggregate crushing plant	8-Dec-14	
31	Site-Specific ESMMP-CP for Earthwork of waste disposal area	8-Dec-14	
32	Site-Specific ESMMP-CP for Encase concrete and Retaining wall at OL entrance	17-Dec-14	
33	Site-Specific ESMMP-CP for Owner's Base Camp	28-Oct-14	
34	Site-Specific ESMMP-CP for Contractor's Camp		X
35	Site-Specific ESMMP-CP for Workers Camp (PKC, MV-DC, SECC, Lamsay, TCM, Songda 5, and Camp No.2	20-Nov-14	
36	Site-Specific ESMMP-CP for Owner's Base Camp	28-Oct-14	
Total		**25**	**11**

During the 1st half of 2014, NNP1 observed that SS ESMMPs being submitted did not provide adequate detail for proper monitoring. Plans were found to be generic and rely heavily on direct extracts from the Owners ESMMP-CP, and not related to site specific conditions. Importantly, detailed information on pre-construction site conditions, detail of intended works and mitigations was less than what was needed for proper evaluation and monitoring.

Construction of the access road was advanced and needed to continue to avoid delays in overall construction. Of the 36 plans, eleven (11) remained unapproved as the contractor continued with works on these sites.

In the absence of approved SS ESMMPs, and the need for meeting construction schedule, NNP1 compliance monitoring of these sites still occurred, under the auspices of Owner ESMMP-CP requirements. Non Compliance Reports were issued accordingly. (Refer to the section on Non Compliance Reporting.)

In July 2014 NNP1 conducted an *SS ESMMP Development Workshop* with Obayashi Corporation (main contractor) to improve the quality of plans being submitted. At about

that time Obayashi Corporation recruited an environmental manager, and these two events precipitated improvement to the quality of reports.

In the 2nd half of 2014 contractor and NNP1 EMO staff and SOPs were in place, and it was agreed that contractor SS ESMMPs priority needed to focus on forthcoming major construction activities. SS ESMMPs were then prioritized. This meant the completion of the unapproved eleven plans was deferred, but compliance monitoring continued.

2.3.1 Non Compliance Reporting

A non-compliance reporting system was initiated by NNP1 in April, 2014. NCR is now a Standard Operating Procedure (SOP).The primary purpose of generating a non-compliance report (NCR) is to raise awareness of environmental issues and facilitate appropriate corrective actions by the contractor.

An NCR is generated when the contractor or sub-contractor fails to meet the required mitigations outlined in the SS ESMMP. For example, elevated levels of coliform present in discharge water, exceeding specified criteria.

Currently three levels of non-compliance levels are used (Levels 1, 2, and 3). Refer to **Error! eference source not found.**. All non-compliance issues identified are recorded in a database. Routine inspection and assessment is undertaken by NNP1 Compliance Officers to determine if the NCR issue has been resolved, or if it requires escalation.

Table 5 Non Compliance Report levels

Level	Significance
1	Non-compliance issue but not an immediate threat to people or environment.
2	Moderate impacts or anticipation of more significant impacts if unattended.
3	Significant impacts to people or environment or reasonable expectations of significant impacts.

Non-compliance issues can be assigned Level 1, 2 or 3 depending on their significance without stepping through each level. Level 1 NCRs should not be regarded as negative toward the contractor. NCR 1 are largely an administrative tool to identify current issues and track the remedy progress. However, NCR 2 and NCR 3 do indicate that the contractor has not satisfactorily met their agreed obligations to remedy an issue. All non-compliance issues identified are recorded in a database.

2.3.2 Contractor Non Compliance Record

Weekly NNP1 construction monitoring is conducted at all sites. The inpsection results are shared with the contractor at a Coodination Meeting every week. In addition to the NNP1 inspections, joint inspsctions are undertaken fortnighly between NNP1 and the contractor at priorty sites. All sub contractor compliance is managed through the main contractor, although inspections usually involve the project managers of sub contractors.

Between August to December 2014 thirty (30) non compliance reports were issued to the contractor/sub contractor. Table 6 is a summary of Level 1 NCR issued.

Table 6 NCRs issued to December 2014

	Site	Issue and Action	Resolution date
1	Meuang Vang Development Company (MVDC) Camp	Issue: Emptying septic system and disposing sludge without prior notice and approval from NNP1. Response: NNP1 request 7days prior notice to inform the contractor of the method and location of disposal.	3/12/14
2		Issue: Elevated pollutants from septic discharge Response: Requested septic upgrade.	16/12/14
3	Phoukhong Construction Sole Company (PKC) Camp	Issue: Improper function of grey water treatment facility Response: Improve design and monitor.	31/12/14
4		Issue: Improper hazardous waste storage Response: Improve waste storage facility and record keeping	31/12/14
5		Issue: Improper hazardous waste storage causing spillage. Response: Clean contaminate area, and provide training to Stock Yard and Camp staff.	31/12/14
6		Issue: Improper disposal of used cement bags Response: Careless storage of used tires.	31/12/14
7	TCM Engineer Corp. (TCM Camp)	Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve waste storage facility and record keeping. Clean contaminated area.	16/12/14
8		Issue: Non functioning septic system Response: Improve wastewater treatment facility and inform NNP1 of new design prior to upgrade. No discharge until improvements are demonstrated to be adequate. NNP1 assist with WQ monitoring of works. TCM to self monitor. (NCR Level 1 issue, elevated to Level 2)	16/12/14
9	Road T11	Issue: clearing vegetation beyond pegged area, erosion and sedimentation of the local waterways. Response: Work only within designated areas, and improve erosion protection of temporary spoil disposal areas,	28/12/14
10	Re-regulation dam	Issue: work site drainage causing sedimentation of the Nam Ngiep.	16/12/14

	Site	Issue and Action	Resolution date
	site.	Response: Increase size of the sediment retention pond.	
11		Issue: improper storage of spoil. Response: Transfer spoil material to designated area.	16/12/14
12	Right Tunnel Company (RT) Camp	Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve waste storage facility and record keeping. Clean contaminated area.	11/12/14
13		Issue: Improper domestic waste management. Response: Transfer waste to designated landfill.	11/11/14
14		Issue: Improper function of grey water treatment facility Response: Improve design and monitor.	3/12/14
15		Issue: SS ESMMP required for Response: Supply SS ESMMP for NNP1 review and approval	18/11/14
16		Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve hazardous waste storage facility and record keeping. Clean contaminated area.	11/12/14
17		Issue: Non functioning septic system Response: Improve wastewater treatment facility and inform NNP1 of new design prior to upgrade. No discharge until improvements are demonstrated to be adequate. NNP1 assist with WQ monitoring of works. RT to self-monitor.	16/12/14
18		Issue: Improper hazardous waste storage. Response: Improve hazardous waste storage facility.	16/12/14
19		Issue: By NNP1 due diligence monitoring, vendor supplied water was found to have low level contaminants – faecal coliforms. Response: NNP1 to undertake due diligence monitoring of vendor supplied drinking water. Contractor requested to ensure drinking water supplied to Lao quality guidelines.	28/12/14
20		Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve hazardous waste storage facility and record keeping. Clean contaminated area. Provide training to staff on appropriate hazardous waste management and storage	16/12/14
21		Issue: Improper hazardous waste storage. Hydrocarbon spills.	31/12/14

	Site	Issue and Action	Resolution date
		Response: Improve hazardous waste storage facility and record keeping.	
22		Issue: Kitchen oil traps and grey water system drainage ineffective. Response: Improve design and monitor.	28/12/14
23		Issue: Non functioning septic system Response: Improve wastewater treatment facility and inform NNP1 of new design prior to upgrade. No discharge until improvements are demonstrated to be adequate. NNP1 assist with WQ monitoring of works. RT to self monitor.	31/12/14
24	Songda 5 Joint Stock Company Camp	Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve hazardous waste storage facility and record keeping. Clean contaminated area.	16/12/14
25	Vilayvannh & Keota Concrete Sole Company (V&K)	Issue: Improper domestic waste management. Response: Transfer waste to designated landfill.	18/11/14
26		Issue: Non functioning septic system Response: Improve wastewater treatment facility and inform NNP1 of new design prior to upgrade. V&K to self-monitor.	18/11/14
27		Issue: Improper function of grey water treatment facility Response: Improve design and monitor.	16/12/14
28		Issue: Improper hazardous waste storage. Hydrocarbon spills. Response: Improve hazardous waste storage facility and record keeping. Clean contaminated area.	16/12/14
29		Issue: Improper domestic waste management. Response: Transfer waste to designated landfill.	16/12/14

2.3.3 Level 2 NCR

One Level 2 NCR was issued to the Contractor regarding observed elevated pollutants, particularly fecal coliforms, being discharged from TCM Sub-contractor Camp between August and October 2014. Upgrade of the system occurred in October. No discharge was observed from the site in November and December 2014, so no testing by NNP1 was conducted. However, in addition to the contractors own monitoring of the facility, NNP1 did assist by taking 'grab' samples from the final effluent pond to assess the upgraded systems function.

Contaminated effluent discharge was also observed from waste water treatment facilities at Right Tunnel Camp, PKC and MVDC camps. These were issued NCR Level 1.

2.4 WASTE MANAGEMENT

2.4.1 Common Construction and Domestic Waste

By mid-2014 no landfill site for common construction waste had been constructed. The construction focus was on the access road, and the main waste being generated was domestic waste from worker camps. Inspections of the camp waste management facilities found them to be poorly managed (open pits with poor draining). These were a risk to worker health, and a potential source of environmental pollution. Camps were requested to shut down these facilities. At that time only the Civil Works Contractor, with three sub-contractors were operating on site. On closure of the camp waste pits, the contractor made an agreement with the Urban Planning Development Organization (UPDO), Paksan District to have wasted collected and then transferred to the Paksan Landfill.

The Paksan Landfill is a 5ha site, 8km south of Paksan Town, and about 70km from NNP1 Project area. An inspection by NNP1 of the landfill on 10th September 2014 found it did not meet environmental and social safeguard requirements. There was no overall plan of management for the site. Waste was neither segregated nor buried. The site operated on a reverse-and-empty basis, with waste even being dropped along it's access road. There were no waste cells, leachate ponds, pits, water supply, drainage, electricity and traffic control. In addition, at the site were 16 casual workers separating recyclables. Working conditions were poor, and personal protection was low. Risks to worker health was high.

Photo 2 Paksan Landfill reverse-and-empty operation

Photo 3 Casual workers sorting waste on the landfill access road.

On 26 September 2014, the ESD requested formally to the contractor for immediate discontinuation of waste transfer to the Pakxan Landfill facility, and to provide new waste disposal area at site. It was requested that waste from the site be temporarily stored within the construction area until a landfill systems was constructed.

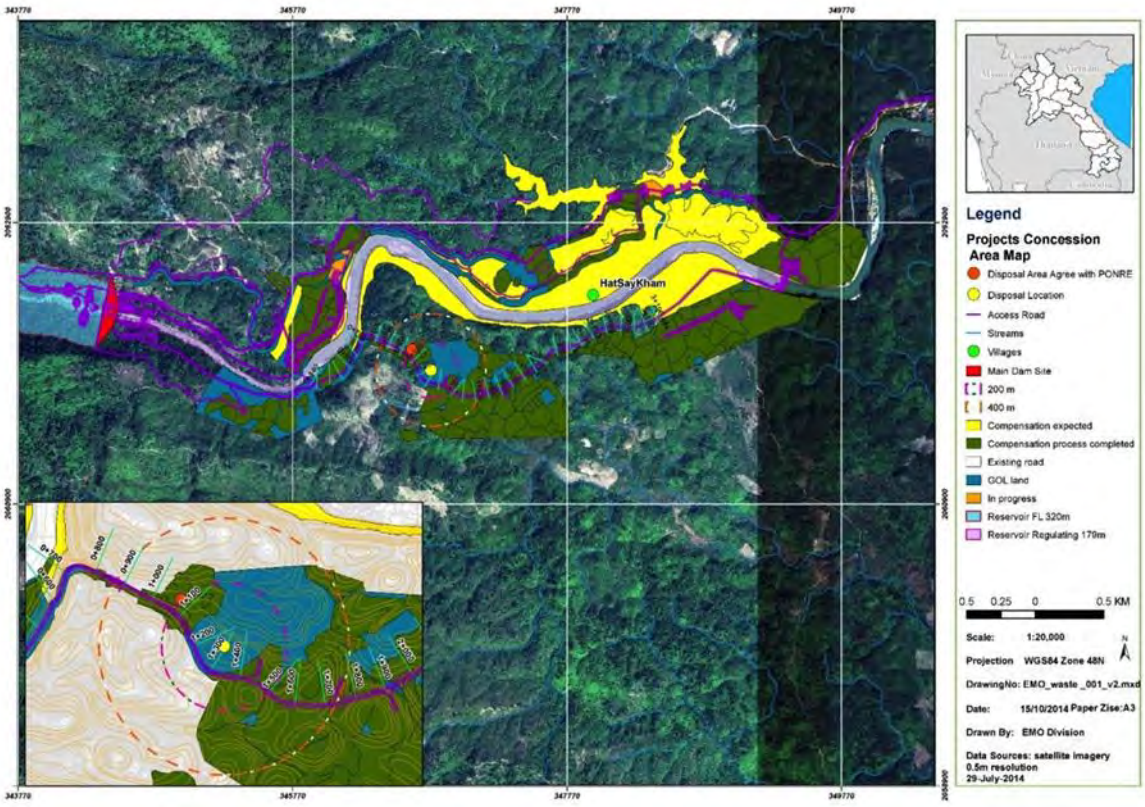
2.4.2 NNP1 Solid Waste Management

To resolve the issue of how to process solid waste, NNP1 and the contractor held a workshop to discuss alternative waste management measures. The workshop included an assessment of potential landfill sites within the NNP1 project area. Based on environmental, social and access considerations, it was agreed a site nearby to Spoil Area 6 (right bank) was preferred. This site selection was also supported by the Bolikhamxay Provincial Government, who had earlier inspected the proposed site on the 25th September 2014.

On 27 October 2014, the NNP1 provided the contractor a detailed design layout and technical specification for the NNP1 Landfill facility. Never the less, as no alternative could be found immediately, transfer to the Paksan site continued for the entire reporting period.

Progress of the NNP1 Landfill facility was made in December 2015 as the contractor partially completed land clearing and earthworks. Two temporary pits were installed but were still not being used as of December. Refer to Figure 2for the location of the NNP1 Project Landfill site – adjacent to Spoil Area 6.

Figure 6 Location of NNP1 Solid Waste Landfill



At camps contractors continue to temporarily hold waste in designated areas waiting collection an transfer to Paksan. All sites not having the required standards, practices and procedures were issued with NCRs. Refer to section 2.3.2

2.4.3 Hazardous Waste Management

A Hazardous Material (HazMat) Audit was conducted during October to December 2014 by representatives from NNP1 and the Contactor. The audit included site inspection of HazMat storage and disposal areas and Hazmat documentation checking including HazMat registration, general procedures and training (including emergency response, HazMat handling, safety, and refuelling). General issues identified include:

- Sites lack general procedures (i.e. safety, spill response, refuelling). HazMat Registration, SOPs, safety procedure were not sighted during inspections;
- Sites don't have adequate information label displayed on containers. Materials safety data sheets were not sighted;
- Sites were yet to conduct formal training for HazMat handling / spill response;
- At the time there were no means of recycling or disposal of hazardous materials. Used materials were being stored on site.

The Hazmat audit inspected PKC Camp, MV-DC Parking and TCM Camp. Issues in PKC Camp and MV-DC Parking remained same as the previous inspection in November 2014 (refer to above) including lack of documentation, labelling of materials, procedures and staff training. Some upgrades at TCM Camp where noted, including provision of staff training records and procedures for Hazmat management such as refuelling. However, these procedures have not been posted within premises. Updates of the Hazmat audit for December 2014 are provided in Table 11 of the Appendix section.

All sites not having the required standards, practices and procedures were issued with NCRs. Refer to section 2.3.2

2.4.4 Medical Procedure Wastes Management

Medical waste in the reporting period was very minimal, mainly used swabs, cotton balls and bandages. As the NNP1 Landfill facility was not operating in the reporting period, the contractor practice was to mix medical waste (from camp clinics) with general waste and transfer it to the Paksan landfill.

An NNP1 assessment in November 2014 investigated options for medical waste disposal. It found there was no incinerator in the Pakxan township area or Bolikhamxai Province operating It also found that incinerators at all Vientiane hospitals were out of order, and that their medical waste were being disposed at the local Vientiane landfill at km 32 on Road No.13., which does have an operational incinerator. However, at this site only medical sharp equipment (i.e. syringes, needles, disposable scalpels and blades) is allowed to be incinerated. As with Bolikhamxay province, hospital tissue waste is combined with general domestic waste and disposed of in the landfill pit.

Response: NNP1 will construct a medical waste disposal pit – to agreed safeguard standards – at the Project Landfill site. In the meantime medical wastes are being temporarily stored inside sealed disinfected drums. Medical sharp equipment is also stored in drums, but separated from tissue material. Sharp objects will be transferred to Vientiane landfill for incineration.

2.5 WATER QUALITY MONITORING

2.5.1 Surface water (river) quality monitoring

To assist the company's understanding of the condition of surface waters in the catchment, and its construction activity impacts downstream, water quality monitoring is conducted at 11 locations in the watershed. Six (6) sites are located in the upper Nam Ngiep above NNP1 Project, and include the Nam Ngiep main channel, lower reaches of both the Nam Chiane and Nam Phouan systems. Three (3) sites are located in the Nam Ngiep below the project, and one site on the lower Nam Xao.

In addition, there is one (1) Nam Ngiep surface water quality monitoring point within the construction area, and one (1) immediately downstream. Refer to Figure 7.

For surface water monitoring twenty five (25) parameters are tested and include the following:

1) pH
2) DO (%)
3) DO (mg/L)
4) Conductivity (µs/cm)
5) TDS (mg/L)
6) Temperature (°C)
7) Turbidity (NTU)
8) Arsenic (mg/L)
9) Calcium (mg/L)
10) Iron (mg/L)
11) Lead (mg/L)
12) Magnesium (mg/L)
13) Manganese (mg/L)
14) Mercury (mg/L)
15) Potassium (mg/L)
16) Sodium (mg/L)
17) Total coliform (MPN/100mL)
18) Ammonia-Nitrogen (mg/L)
19) BOD (mg/L)
20) COD (mg/L)
21) Chloride (mg/L)
22) Nitrate-Nitrogen (mg/L)
23) Sulfate (mg/L)
24) Total Alkalinity (mg/L)
25) TSS (mg/L)

The results of those parameters which exceeded guideline standards are provided in the following tables. For surface waters only Chemical Oxygen Demand (COD), Faecal and Total Coliform exceeded guideline standards over the reporting period. (Full water quality monitoring results are located in the Appendix section).

2.5.1.1 Chemical Oxygen Demand results

Chemical Oxygen Demand (COD) is an expression of the amount of water-dissolved oxygen used to break down compounds in the water which cannot be broken biologically. The

higher the COD reading, the greater concentration of pollutants. COD was recorded high across a number of sites, and for all months over the monitoring period. COD was highest in September upstream and within the project area, but was not detected at sites below NNG06, which is located immediately below the Nam Xao confluence. The widespread and persistent elevated levels of COD suggest mild polluted conditions.

	Standard	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
December	<5.5 mg/l	15.9	ND	ND	ND	ND	28.6	12.7	ND	ND	ND	ND	ND
November		14.4	11.2	14.4	ND	ND	ND	ND	11.2	ND	14.4	17.6	11.2
October		15.9	19.1	19.1	24	28.6	15.9	19.1	ND	12.7	15.9	ND	15.9
September		ND	48	ND	93.6	55.8	48.2	50	ND	ND	ND	ND	ND

ND – not detected

2.5.1.2 Fecal and Total Coliform results

September was the only month in 2014 to have monitored Fecal Coliforms. September is typically at the peak of the wet season, with surface runoff transporting pathogens from diffuse and point sources, concentrating in river systems. All sites, excluding the site on the lower Nam Chaine, recorded elevated levels of fecal coliform. The highest recorded value was at NNG04, within the Nam Neip project area.

For Total coliforms, only November at NNG05 exceeded standards. The site is located immediately downstream of NNP1 construction area, and this suggest that the project activities may be impacting on surface water quality of the Nam Ngiep. Fecal coliform monitoring was resumed from January 2015. (Also refer to sections 2.3.1)

	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
December*	Non exceeded										
November*					5400						

October*	Non exceeded										
September**	230	3300	1700	92000	2200	3300	2200	2300	490	7900	7900

*Total Coliforms. Standard is <5000 MPN/100ml
**Fecal Coliform. Standard is <1000 MPN/100ml

2.5.1.3 Effluent Discharge Quality Monitoring

NNP1 is required to monitor all effluent discharge water quality from work sites and worker camps, if that discharge is entering the natural environment. At times when no discharge is observed, such as the case where effluent is being held in tanks, then no monitoring is conducted. During the monitoring period three camps were discharging effluent. These included TCM Camp, RT Camp and MVDC Camp. Sixteen parameters were monitored, as below. Fecal coliform monitoring was discontinued between October to December but was resumed in January 2015.

1. pH
2. Sat. DO (%)
3. DO (mg/L)
4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. TSS (mg/L)
9. Iron (mg/L)
10. Manganese (mg/L)
11. Ammonia (mg/L)
12. BOD (mg/L)
13. COD (mg/L)
14. Oil & Grease (mg/L)
15. Total coliform (MPN/100ml)
16. Fecal coliform (MPN/100ml)

Parameter and standard	**September 2014**	**October 2014**	**November 2014**	**December**
TSS	-	No parameters exceeded/or no	TCM – 102 mg/l	TCM - 72 mg/l

Parameter and standard	September 2014	October 2014	November 2014	December
(<50 mg/l)	-	discharge.	-	RT - 151 mg/l
BOD	TCM 156 mg/ml		TCM – 156 mg/l	TCM - 80 mg/l
(30 mg/l)	-		MVDC – 41 mg/l	
COD (125 mg/l)	TCM 252 mg/l		TCM – 252 mg/l	TCM - 188 mg/l
Total Coliform	-		TCM – 320k MPN/100ml	TCM - 3500 MPN
400 MPN/100ml	-		MVDC – 540k MPN/100ml	RT – 9200 MPN/100ml
Fecal Coliforms 400 MPN/ 100ml	TCM 160k MPN/100ml		-	-
Oil and Grease <10mg/l	TCM 23 mg/l		MVDC – 11.9 mg/l	-

TCM Camp septic water treatment facility was routinely found to be ineffective for improving the quality of discharged effluent water. For both Total and fecal coliforms, all reporting months, excluding October, recorded elevated counts. BOD and COD levels were also at TCM, and MVDC Camps.

Grey water systems, often used for kitchen and bathing water processing, were also improperly functioning at TCM, MVDC and RT. Elevated levels of oil and grease in discharge waters is indicative of kitchen grease traps not properly functioning.

TCM septic waste-water treatment facility is the subject of Level 2 NCR. RT and MVDC treatment facilities were also dysfunctional and the subject of NCR Level 1.

2.5.2 Groundwater Quality Monitoring

In June 2014 EMO initiated water quality testing of the nearby Nam Ngiep river, B Hatsaykham village water collection points, and village water storage facilities. Testing was undertaken against GOL Drinking Water Quality Standards. Water was analyzed in an ALS certified lab in Australia. Results identified the water sampled from the Ban Hatsaykham drinking water sources was found to be poor with traces of coliforms, elevated oil and grease levels and high turbidity.

SMO working with GOL (Nam Sa At) installed three deep bores with hand pumps within the village. First tests met GOL Drinking Water Quality Standards. Through consultation with villagers it was identified that water was being contaminated by methods used by villagers to transfer bore well water to homes. The Nam Sa At undertook further capacity building to introduce methods of hygiene for village household water storage and use.

Water quality monitoring of the bore well water is routinely carried out. Twenty two (22) parameters are tested. These include the following:

1. pH
2. Sat. DO (%)
3. DO (mg/L)
4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. Arsenic (mg/L)
9. Cadmium (mg/L)
10. Calcium (mg/L)
11. Iron (mg/L)
12. Magnesium (mg/L)
13. Manganese (mg/L)
14. Potassium (mg/L)
15. Sodium (mg/L)
16. Fluoride (mg/L)
17. Nitrate (mg/L)
18. Nitrite (mg/L)
19. Total Hardness (mg/L)
20. Total coliform (MPN/100ml)
21. Fecal coliform (MPN/100ml)
22. E.coli (MPN/100mL)

Groundwater in the three wells was found to have acceptable quality for the reporting period. pH was found to be around ~6 for all wells, which is slightly lower than the 6.5 standards but still acceptable.

Low levels counts of fecal and or Total Coliforms were found in one well in November, and two wells in October. NNP1 carries out livelihood training programs in Ban Hatsaykham, which in part raises awareness about domestic hygiene and the need to boil water before use. The water from each well source is considered suitable for irrigation of crops, washing, bathing and other domestic uses, but requires boiling (and storage of boiled water in sterile containers) to eliminate pathogens and provide for safe drinking water.

November 2014		GHSK01
Total coliform(MPN/100ml	<2.2	23
Fecal coliform(MPN/100ml)	0	1.1

October 2014	GHSK01	GHSK02
Total coliform (<2.2MPN/100ml	9.2	5.1

2.5.3 Construction Discharge Water Monitoring

Testing construction discharge water commenced in November 2014. Nine parameters were tested for construction discharge. These include:

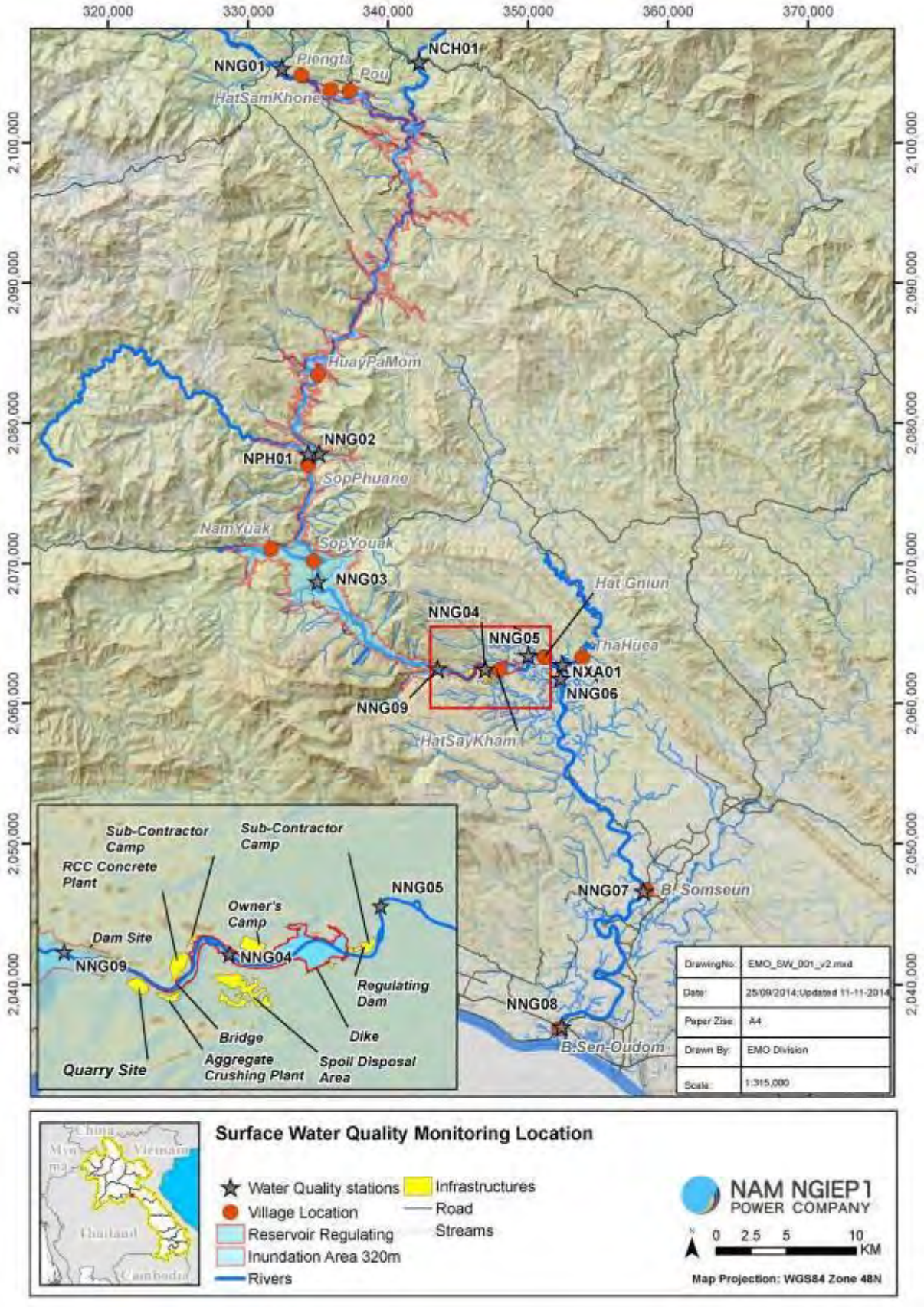
1. pH
2. Sat. DO (%)
3. DO (mg/L)

4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. TSS (mg/L)
9. Oil & Grease (mg/L)

Parameter	Standard	Result for November	Result for December
TSS (mg/L)	<50	361.5	67.5

Only one parameter, TSS, for the months of November and December, at one site the re-regulation dam, was found to exceed standards. Sediment ponds in the excavation pit were enlarged to retain discharge water for longer intervals in an effort to decrease TSS loads.

Figure 7 Nam Ngiep watershed surface water quality monitoring locations



2.6 AIR QUALITY MONITORING

Air quality monitoring was conducted for at least 72 consecutive hours in each of the four (4) Project affected villages in May and December 2014.

In both April and December the project guideline for particulate matter (dust) of 0.12 mg/m3 for PM10 were exceeded at each of the monitoring locations, at variable rates per village. In April PM10 mass volumes were particularly high in Ban Nonsomboun and Ban Hatsaykham, where average concentrations exceeded the Project guideline. For Ban Hat Gniun, very little dust was measured during the monitoring period. In December average dust concentration measurements were low for Ban Hat Gnuin, Ban Nonsomboun, and Ban Thaheau (PM10 of 0.055 – 0.056 mg/m3), while average dust levels were considerably higher in Ban Hatsaykham (0.17 mg/m3) with average concentrations exceeding the Project guideline for this village. Refer to Appendix for results.

In addition to physical monitoring of air quality, EMO undertook routine compliance (observation) monitoring of dust levels in access road villages and camps. EMO also conducts monthly Grievance Meetings with the villages.

Road construction and vehicle passage are considered the most prevalent generator of dust at sensitive receptors (e.g. villages). Villages and contractor camps are a considerable distance from Quarry 1 (and other ancillary construction areas), but are affected by the access road. At Grievance Meetings villagers expressed concern about high levels of dust generated by traffic. As a consequence, NNP1 undertook the following actions:

- All the road sections within 03 villages (Ban Hat Gnuin, Ban Nonsomboun, Ban Nonsomboun) will be sealed in early 2015.
- Speed bumps will also be installed to reduce speed of vehicles.
- Access road nearby other sensitive receptors along the roads, such as ad hoc camps and construction area, have increased frequency of watering.

2.7 NOISE MONITORING

Noise monitoring was conducted for at least 72 consecutive hours in each of the four (4) Project affected villages in April and December 2014. Noise monitoring was measured using the A-weighted scale, as this meter class is considered the most applicable to noise frequencies detectable to the human ear and thus A-weighted noise measurements are the most widely used.

In May 2014, noise emissions never exceed the Project guideline of 115 dB(A), with maximum values ranging from 89.0 in Ban Nonsomboun to 100.6 in Ban Thaheua. Each village average dB(A) values were in the mid-50s (refer to Figures 4-24 – 4-27), below what is considered nuisance level noise for most people. In December monitoring results, noise emissions never exceed the Project guideline of 115 dB(A). Leq (or LAeq for A-weighted scale) sound levels exceeded the Project standard of 55 dB(A) for residential areas / village. However, ambient noise levels in the villages often exceed 55 dB(A) between 6pm and 6am (outside of Project working hours). Noise inputs are generated from combined ambient noise in the respective villages and Project activities and appear to average between what is

generally considered acceptable for residential areas and commercial areas. Noise levels in each village sometimes exceed what is generally considered nuisance level at varying times throughout the day and night. Peak noise events are likely a result of vehicular traffic (Project and unrelated) and blasting activities associated with the Project. Refer to Appendix for monitoring results.

2.8 VIBRATION

Lao PDR does not have a recommended guideline for vibration. Structural damage from road construction activity (e.g. vibratory rollers) and ancillary activity (e.g. blasting at the quarries) is unlikely given the distance from public infrastructure to the construction areas. Nuisance level disturbance for short periods for villagers may have been experienced by villagers during access road construction, but no grievances relating to vibration were recorded during community grievance meetings.

2.9 COMMUNITY GRIEVANCE MANAGEMENT

Village consultations were held by EMO Complaince Inpsction team at least once per month at Ban Hat Gnuin, Ban Thaheua and Ban Hat Saykham. Note: this does not include consultations conducted by SMO or the RMU without EMU involvement.

Most of the village grievances concerned village access road improvement relating to speeding traffic and excessive dust. From January 2015 sections of access road that pass through these villages will be sealed, and speed humps will be installed. A summary of grievances is provided inTable 7

Table 7 Village grievances regarding construction impacts

Village	Grievance/Required Action	Progress
Hat Saykham	• Earth work / excavation of owner's camp resulted in the fence of villager's agriculture land being removed and crops being destroyed by cattle (October). • Concerns with speeding trucks on Road T5 near the village are still an issue. This has potential risk on road accident with children and animals (October and November)	• Issues resulting from earth works require follow up through formal grievance process. SMO and EMO to coordinate. • TD and EMO will limit numbers of vehicles passing through the village. • Compensation has been made for a pig with 300,000 kip paid.
Hat Gnuin	• Road watering needs to be conducted frequently. Speeding of big trucks causes lots of dust (October	• TD and EMO will coordinate with contractor in order to regulate speeding of trucks. • Road paving will be

	and November). • Request NNP1 to provide assistance to upgrade village roads which pass through the village (November). • Speeding of big trucks has potential risk of accident (August to December). • The village access road has been upgraded with support from a contractor (December)	completed by the end of December 2014. • The village access road is built with good condition
Thaheua	• Road watering needs to be conducted frequently (October to December). • Speeding of big trucks when pass through the village creates lots of dust pollution (October and December). • The road construction blocks the way that local people use to go to their rice fields (December). • The request for support to upgrade village access road has not been implemented (December)	• The Contractor started paving the roads in community areas and hope it will finish by the end of December 2014. • TD and EMO will coordinate with contractor in order to regulate speeding of trucks. • The contractor pledged to repair the road that villagers use to access their rice paddies after finish the road construction.

2.10 CONSTRUCTION RELATED MATTERS

2.10.1 Physical Cultural Resources

The general approach regarding cultural property is to develop management and mitigation measures to assist in their preservation, and to avoid their elimination. Chance Find Procedures have been developed for the project. The objectives of the Chance Find procedures:

- Minimize impacts to resources from all NNP1 related activities,
- Ensure that artifacts uncovered are appropriately recorded, documented and reported to the appropriate line agencies.

2.10.1.1 Buddha Image Relocation from Construction Area caves

In September 2013 local villagers informed NNP1 of Buddha images located in caves near the NNP1 Temporary Bridge site. On the 30th November 2013 the images were successfully relocated to the local Temple at Ban Hat Gnuin. The relocation was complemented by

traditional Buddhist ceremonies, which involved Lao department and authorities including Head of Hat Gniun Village, Representative from NNP1, Representative from Bolikhamxay province, Representative from Bolikhan district and RMU.

The relocation of the 29 artifacts did not include a proper archeological recording of each item, nor was an official assessment done to determine if any further relics are within the caves. Construction work continues in the area and so proper documentation and historical archeological evaluation is required.

On the 29th August 2014 Dr Viengkeo Souksavadty concluded a study of the caves and found no further images or relics. The study also made formal documentation of the 29 artifacts and shared this information with the Ministry of Information and Culture, including their new location at the local temple. According to his report, the images were between 40-50 years.

Photo 4 (clockwise) i) Buddha Images at the caves near NNP1 Project bridge. ii) The relocation ceremony. iii) The relocation team from the local village and officials, and iv) new location at Ban Hat Gnuin

2.10.1.2 Archeological Survey of NNP1 Inundation Impacted Villages

A preliminary archaeological survey of the Project Area was conducted by the Lao PDR Department of Museums and Archaeology in October 2007. The survey was carried out separately, and was not specifically conducted for the NNP1 EIA (July 2014). The study area spanned two districts; Hom and Bolikhan. The summary of cultural/archaeological evidence found in the Project area is in the NNP1 EIA. It was agreed between ADB and NNP1 that project inundated villages would be subject to a systematic search for physical cultural resources prior to flooding in 2018. These villages include: Houaypamom, Sopphuane, Sopyouak, and Namyouak are located in the lower reservoir, and Hatsaykham is located within the construction area. This task has not yet been actioned.

2.10.2 Reservoir Biomass Management

Conditions of the Project Lenders *Common Terms of Agreement* require NNP1 to provide an executed *Biomass Clearance Agreement*. For this milestone to be met, NNP1 will have to have in place agreed contracts with biomass clearance firms. The Project Concession Agreement requires the NNP1 to undertake biomass clearance according to the *Step-by-step Environmental Guidelines for Biomass Removal from Hydropower Reservoirs in Lao PDR, December 2012*. There are two components to biomass removal planning: 1) The formulation and GOL approval of a Biomass Management Plan - BMP, and 2) Block Clearance Plans, or BCPs. BCPs which will form the base documents for tendering contractors. The formulation of the BMP and BCPs will commence in the 1st quarter of 2015.

2.10.3 UXO Clearance

UXO clearance is conducted by NNP1 according to the recommendations in the Owners ESMMP Sub-Plan 13: Unexploded Ordnance (UXO) Survey and Disposal, and also related in Sub-Plan 06: Hazardous Material Management and Sub-Plan 16: Training and Awareness.

UXO clearance of all construction work sites, reservoirs, resettlement area and access roads is conducted under contract by licensed clearance teams to NNP1. Certificates of clearance are provided to NNP1, and no work is permitted until such authorization is provided by the owner to contractors. UXO clearance is managed by Technical Department of NNP1.

2.11 22KV TRANSMISSION LINE CORRECTIVE ACTION PLAN

The upgrade of the local 22kV line from Pakxan was required so that three-phase power could be delivered to the dam site to support construction. In September 2014 NNP1 learnt that a sub-contractor had commenced the upgrade of the line without NNP1 authorization. A Corrective Action Plan was initiated to assess the environmental and social impacts of the works. An independent consultant's report (Earth Systems, 18 September 2014) identified that environmental impacts associated with upgrade construction along the TL ROW were found to be minimal, temporary, and of short duration in rural areas, and negligible in villages.

Nineteen kilometers, or 93%, of the 22kV line used the existing EDL ROW. Two new sections were required (1.12km + 120) in the Pakxan village area. From an environmental impact,

permanent vegetation loss / disturbance required in a new 1.12 km TL ROW required approximately 25 m^2 of land required for pole foundations (25 new poles x 1m^2), some of which was vegetated prior to pole implementation. Approximately 12 trees were removed during construction, and some minor erosion and dust was created from pole placement.

	
Some of the trees cleared below the ROW	**A section of the new alignment outside the EDL ROW**

From a social impact, 46 villages in the greater Bolikhan and Thathom districts were indirectly affected during the upgrade due to planned power outages as the existing TL provides power beyond the immediate vicinity of the Project area.

As a response to this unauthorized action, NNP1 requested that the Head Contractor improve reporting and work authorization systems between it and its sub-contractors to avoid further breaches. Costs of the Corrective Action Plan were passed on to the contractor.

Figure 8 22kV new ROW section close to Paksan Town

3 POGRESS OF CURRENT ENVIRONEMTAL ASSESSMENTS AND MANAGEMENT PLANNING

3.1 HOUAY SOUP RESETTLEMENT AREA IEE

An IEE for Houay Soup was prepared in July 2014. ADB comments were subsequently received 20 August 2014 and these were rolled into a redraft that was presented to ADB on the 19 November 2014.

The original TOR focus for the IEE was to assess the impacts on stream-systems from resettlement. After review the ADB and IAP have requested greater attention be given to how the resources in the Protected Forest Area land, particularly forests, were going to be managed. The IEE for Houay Soup Resettlement Area is now subject to revision, and will be disclosed 120days prior to the commencement of resettlement, expected to be in the 1st quarter of 2016.

3.2 230KV TRANSMISSION LINE IEE UPDATE

The ROW alignment has been adjusted several times since 2002 design concept to avoid boundaries of the Phou Khao Kouay National Protect Area (PKK), the Ban Na Elephant Conservation Zone (ECZ), Houay Ngua PPA, and the Leng Nam Ngiep + Nam Mang National Protection Forest Area (PFA). This has been confirmed by additional field studies conducted by the project.

The Initial Environmental Examination (IEE) of the NN1 Hydropower Project's 230 kV Transmission Line was conducted by ERIC in 2012 and updated by ERM (May 2014). This work provided an initial assessment of potential impacts on biodiversity utilizing *normal difference vegetation index* (NDVI) data. Lenders have requested to confirm and refine the findings of the earlier ERM report, regarding biodiversity values along the proposed alignment. An evaluation is currently underway. The alignment has also been changed to avoid concession plantations, and for construction suitability in the landscape. The May 2014 IEE, if required, will be updated based on the results of the assessment.

3.3 115KV TRANSMISSION LINE IEE

NNP1 is waiting for the design and construction schedule from the GOL of the 115kV transmission line. The Initial Environmental Examination for this facility has not commenced. NNP1 will support GOL to completed necessary studies and compensation arrangements. The 115kV TL will be used to distribute 18MW from the regulation dam. It will be owned and operated by the GOL.

3.4 HOUAY NGUA PROVINCIAL PROTECTED AREA CONSERVATION MANAGEMENT

NNP1PC have provided $48,000 to Bolikhamxay PONRE for forest management training for staff and local villages; establishment of checkpoints at either end of the access road through the Houay Ngua Provincial Protected Area (PPA); and forest patrolling by PONRE

and Provincial Forestry College students. These activities were conducted between August and December 2014. PONRE has requested ongoing support for the program, which is now subject to NNP1 review.

3.5 ENVIRONMENTAL PROTECTION FUND

According to the CA, NNP1 has an obligation to provide $990K throughout the concession period to the GOL Environmental Protection Fund (EPF), in which $180K has to provide before the COD.

NNP1 held discussion with EPF Director in August 2014 in regards to the process of transferring, and the use of EPF. It was suggested that the NNP1PC send a letter to EPF indicates such payment. A letter has been drafted (both Lao and English languages), it is being finalized between NNP1PC and its lenders. EPF Director initially agreed that the fund will be allocated to two EPF Operation Windows: Community and Biodiversity Investment (CBI), and Water Resources Management (WRM).

Discussion are ongoing for the EPF to be used to test mechanism for delivering biodiversity offset outcomes for the NNP1 project.

3.6 INTEGRATED SPATIAL PLAN FOR XAYSOMBOUN PROVINCE

Integrated spatial planning (ISP) program was recommended through ADB and IAP mission to be incorporated from watershed and biodiversity management planning. The NNP1 has set aside company budget to assist Xaysomboun Province develop an ISP for the province.

ISP development is being led by the Department of Environment Quality Protection (DEQP) under of the Ministry of Natural Resource and Environment (MONRE).

A meeting was conducted between DEQP and NNP1 Team on 25 December 2015, to work through the process of establishing an ISP in Xaysomboun Province. Some key information that was noted from the meeting:

- There should be policy dialogue between MONRE and Provincial authority prior to ISP program. This will set the course and coordination framework as highlighted through ISP guidelines.

- The DEQP is currently piloting ISPs in Ouydomxai, Champasak, Luang Nam Ta, Xayaboury, Savanaket and Luang Prabang Provinces. Xaysomboun Province would benefit from their lessons learnt. It will take approximately 2years for the ISP program to complete.

In regard to ISP program for Xaysomboun Province, Xaysomboun PONRE was required to make an official request to DEQP for the ISP, and NNP1 would consider financial assistance. After approval, a committee will be established in Xaysomboun Province and the program will be led by the Department of Planning and Investment (DPI) at provincial level.

3.7 EROSION AND SEDIMENTATION MONITORING

NNP1 is required to prepare a river bank garden (RBG) inventory to establish a baseline of all riverbank gardens that may be affected by the NNP1 and NNP2 dam operations. In its first phase, this inventory will serve as the baseline of the river bank garden status before NNP2 hydropower project begins operations in 2015. In its second phase, the survey will be conducted again in 2016 to compare the river bank garden after NNP2 operations commence. This is conducted to ensure that impacts brought about by NNP2 are not transferred to NNP1. In its third phase, this inventory will also serve as evidence of land ownership/user and production of the land in question once RBG registration occurs. This task will be actioned in February 2015.

3.8 FISHERIES MANAGEMENT

A Fisheries Management Program (FMP) is being implemented by NNP1. The program has two key initiatives: 1) define trends of fish catch for village consumption, and 2) prepare fisheries conservation strategies - for both biodiversity values and for the protection of fish stocks, generally. A fish catch monitoring survey will commence in the 1st quarter of 2015, and its outcomes will serve both FMP initiatives. Planning and survey design commenced during the last quarter of 2014.

3.9 FLOOD EVENT MONITORING

On the 18th September 2014 a flood inundated areas within the NNP1 project area. NNP1 mobilised teams to survey the damage and measure the events magnitude. A summary of impacts is provided below.

- B. Xomsern: area of flooded is approximate 25% of village residential area and ~10% of land agriculture land.
- B. Thaheua: 36 residential houses and 60% of residential area between 0.5-1.6 m. Village agriculture land is flooded to a depth between1-3 m,
- The upper reservoir zone flooded including the villages of B. Poua (one house and 10 paddy plots), Hatsarmkhone (six houses and 77 paddy plots),

Photo 5 Ban Xomsen 18th September 2014

4 WATERSHED AND BIODIVERSITY MANAGEMENT

NNP1PC accepts that integrated watershed management is a priority issue. As the lower end user of the Nam Ngiep watershed it is in NNP1PC's direct interests to commit and support government, community and private sector interests in watershed development. To not do so would be to leave our operations, productivity and sustain ability to considerable risk.

The development and implementation of the Watershed Management Plan is cross sectorial within NNP1PC and externally. A Watershed Management Specialist and team have been formed and are currently liaising with government to establish the WMC, with the intention of achieving the seven objectives. The WMC will be the vehicle through which aspects the NNP1PC CA related commitments will be passed on to GOL for implementation.

4.1 WATERSHED MANAGEMENT COMMITTEES

The Watershed Management Committee (WMC) is recommended in Project Environmental Impact Assessment (EIA) for the preparation and supervision of watershed management plan. The discussion on WMC was initiated since August 2014 at Provincial level involving both Xaysomboun and Bolikhamxay Province. Series of workshops was made to introduce the obligation under biodiversity offset and watershed management, the concept of watershed management strategy, the link between watershed and biodiversity offset management, and the institutional arrangement for programs implementation.

The WMC was established in Xaysomboun Province on 27 August 2014 and in Bolikhaxay Province on 9th September 2014. The committee chaired by Vice Governor of Xaysomboun Province and co-Chaired by the Bolikhamxay Governor, Deputy Chaired by the Head of PoNRE in Xaysomboun and Deputy Head of PoNRE in Bolikhamxay province, and comprised of related provincial departments and governor of districts concerned. The leading role of this committee is to supervise the preparation and implementation of watershed management. In addition, the WMC will also supervise the preparation and implementation of biodiversity offset management within the NNP1 watershed area, it is the case that NNP1 watershed area is concluded after the biodiversity survey to be suitable site for biodiversity offset.

At the operational level, Watershed Management Office (WMO) was established under the supervision of PoNRE of Xaysomboun and Bolikhamxay provinces to lead related agencies and local communities for the preparation and implementation of watershed management and the biodiversity offset management in the NNP1 watershed area.

A national level meeting on 3 October 2014, which was chaired by Vice Minister of MoNRE endorsed the WMC and its administrative procedure, and government financial arrangement for the biodiversity and NNP1 watershed management programs. The meeting also agreed the last quarter of 2014's work plan (October to December 2014), which later, the NNP1PC was asked by MoNRE to lead the implementation.

4.2 COMMITTEE FOR BIODIVERSITY OFFSET PROGRAM

Biodiversity Advisory Committee (BAC) is the key technical committee for biodiversity offset program in reference to ADB FA. The institutional arrangement of BAC is being formulated through updated Biodiversity Offset Framework (BOF). This committee will be independent and comprise of at least three experienced biodiversity experts, in order to adequately monitor and advise the Biodiversity Offset Management Committee (BOMC) and related agencies on the preparation and implementation of biodiversity offset measures. The TOR and administrative procedure is being developed, potential candidate being located. The recruitment process will proceed once ADB and GOL agreed to the TOR and candidates.

At operational level similarly to WMO, Biodiversity Offset Management Office (BOMO) will be established under the supervision of PoNRE of the respective provincial administrative area where offset site is located. BOMO will be the office leading the implementation of biodiversity offset management program under NNP1.

4.3 UPDATED BIODIVERSITY OFFSET FRAMEWORK (BOF)

The updated Biodiversity Offset Framework (BOF) is required to be agreed by government and submitted to ADB on or before 31 December 2014. The process prior to BOF submission on 31 December 2014 can be described as follow:

- The draft of BOF update was prepared in close collaboration with GoL. This to ensure that the concerned points under ADB FA section 17.2 (a) are well understood by GoL and addressed within the updated BOF.
- The first draft was submitted for ADB review on 21 November 2014. The key comments related for further revision include: time bond action plans, the design of baseline biodiversity survey, and the TOR of Biodiversity Advisory Committee (BAC). The revision was made to the draft and resubmitted for further review on 28 November 2014.
- The discussion with ADB and IAP mission visit on December 2014 clarified the issues for further revision. It was also advised to consider the review by ERM who prepared the original BOF that was approved on 11 April 2014. The comments from ERM were also incorporated into the draft.
- The meeting with GOL (DFRM and two PoNREs) was held in Paksan on 26 December 2014 to discuss the updated BOF and TOR for BAC. The updated BOF and TOR for BAC were approved through this meeting and submitted to ADB on December 30, 2014. The official minute of the meeting (MoM) for the meeting on 26 December 2014 can be seen in the Annexes.

However, additional comments have provided by ADB and further revision of the BOF is needed, hence the new deadline has been setup for BOF submission

4.4 BIODIVERSITY OFFSET BASELINE SURVEY

In the EIA, July 2014 ERM provided assessment of biodiversity values for the entire project area including dam sites, access roads, and transmission lines. ERM biodiversity values assessment was based on normalized difference variation index (NVDI) interpretation. NDVI is a remote sensing indicator that provides a measure of vegetation density and condition by indicating the photosynthetic capacity of the land surface cover. NDVI classes – Benchmark: 0.8 to 1.0; High 0.6 to 0.8; Moderate: 0.4 to 0.6; Low: 0.0 to 0.4; Impacted: –ve to 0.0. The NDVI and land cover calculations are based on 5 meter square pixels.

NNP1 has acquired a high resolution image (November 2014) of the entire project area and watershed to examine actual vegetation cover, connectivity and biodiversity values- not relying on photosynthetic outputs. This image analysis will support the work of the Biodiversity Baseline Survey in choosing sites, as well as for monitoring ongoing changes to vegetation cover. New updated images will be acquired over the concession period.

4.5 GENERAL AWARENESS RAISING TROUGH CONSULTATION

Prior to preparation and implementation of WMP and Biodiversity Offset Management Plan (BOMP), the consultation process was conducted by NNP1PC and related GOL's agencies in particular Department of Forest Resources Management (DFRM), Provincial Office of Natural Resources and Environment (PoNRE) of Xaysomboun and Bolikhamxay provinces), and official from Anouvong, Hom, Thathom, Paksan, and Bolikhan districts. This consultation process is intended for general awareness raising and to get consensus among local government (province and district) and local communities on the biodiversity and watershed management program.

The consultation process was designed for selected villages in Xaysomboun and Bolikhamxay Province that includes: a) villages located within the NNP1 watershed area; b) villages located within the buffer zone of the NNP1 watershed area (five kilometers); c) village located outside the buffer zone but impacted from NNP1 watershed's activities will be considered for the future consultation process; d) villages located in riparian area of Nam Ngiep River outside the upper and lower of NNP1 watershed.

The highlight from consultation process that was conducted from October to December 2014 in the total of five districts and 48 villages in Xaysomboun and Bolikhamxay Province could be described as follow:

- The targeted villages agreed to provide the support for biodiversity and watershed program. Regarding the biodiversity offset, if it has to be within the NNP1 watershed areas, the community agreed to support the protection of wildlife and aquatic animal, the protection of certain habitat, and all related activities.

- Some villages along Nam Ngiep River addressed the concern on fishery such as: the need to have Fish Conservation Zone (FCZ), the situation where the result from fish harvesting is lower in the recent year, and to sustain fishery activity that will be affected from dam construction. Other concerns that have been addressed by the

communities include: 1) the control measures for erosion and sedimentation particularly in the area that has high slope; 2) the measures on seasonal flooding due to dam construction that will affect the river garden and some agriculture plot; 3) the need to consider the compensation and/or relocation and flood awareness program for the affected community.

- Most of the targeted villages have village land use map that can be observed on the notification board prior to entering the village area or near the village meeting hall. It was noted that the village land use map was created from land use planning activity under Participatory Land Use Planning (PLUP). Related to land use planning, some of the villages recommended for updating their land use information prior to implementation of NNP1 watershed management.

- Aside from biodiversity and watershed program, the communities also addressed their concerns on: clean water supply because of limited natural resource and poor quality of water for consumption/domestic use; village fund to support community livelihood such as small livestock rising, gardening, and waving; and the job opportunities for local people.

The consultation process was able to obtain the information of certain biodiversity and fish species under concerned list of EIA report. This information and general notes from consultation process will be used for further watershed and biodiversity study

4.6 BIODIVERSITY AND WATERSHED NNP1 ORGANIZATION ARRANGEMENT

The biodiversity offset and watershed management program was managed by three staff (one Deputy Manager, one Biodiversity Team Leader, one Senior Watershed Officer) between August to September 2014. Most of the personnel are on board from October 2014, and the remaining officer positions are expected to be filled during February 2015.

5 OCCUPATIONAL HEALTH & SAFETY OF CONSTRUCTION WORKERS

5.1 SAFETY ORGANISATION

Since issuance of the Notice to Proceed in October 2014 to the Civil Contractor, safety has been monitored and managed by one safety officer employed by NNP1, another by the Contractor and one for each subcontractor. They report to senior management within their organisations and in the case of the Contractor and subcontractors to their respective Project Managers. The philosophy of the Project is that every site engineer and site manager is a safety officer.

5.2 SAFETY PATROLS, COMMITTEES AND MEETINGS

In October 2015, a Joint Monthly Safety Patrol was established. Every month the Patrol meets together on site for a whole morning when three or more different sections of the construction works are visited and inspected for safety hazards. The Patrol comprises all the safety officers and their senior managers representing the Owner, the Contractor and each

subcontractor. All participants visit every location together. The Patrol culminates in a 30 minute wrap-up meeting that runs through the safety hazards identified and the corrective action to be taken, if still outstanding. A report is circulated to all participants within 24 hours of the meeting with documentation of the actions necessary.

One week later the same participants spend at least one hour at a Safety Committee Meeting when the safety hazards from the Patrol are reviewed for actions taken and outstanding, all reportable safety incidents are discussed with respect to risk avoidance in the future, and a special safety topic is chosen for presentation by a selected individual nominated beforehand. Discussion by participants is encouraged. The meeting is minuted.

Periodic inspections of the various construction activities are made on a regular basis and with regard to events on site.

5.3 SAFETY TRAINING

All the training that the Safety Officers of the Owner and Contractor carried out in the period August to December 2014 is provided in the Contractor's Monthly Progress Reports but is summarised below. This includes all training by external and internal trainers and toolbox talks given by Owner, Contractor or Subcontractor personnel.

Table 8 Safety Training for the reporting period

	Number of training	Cumulative total number of trained workers in each month	Remarks
October, 2014	14 times	116	General/ Site regulation/ New Employee indoctrination
November, 2014	14 times	208	Site Regulation/ New Employee indoctrination
December , 2014	45 times	1651	General/ Speed limit

5.4 SAFETY CLASSIFICATION AND STATISTICS

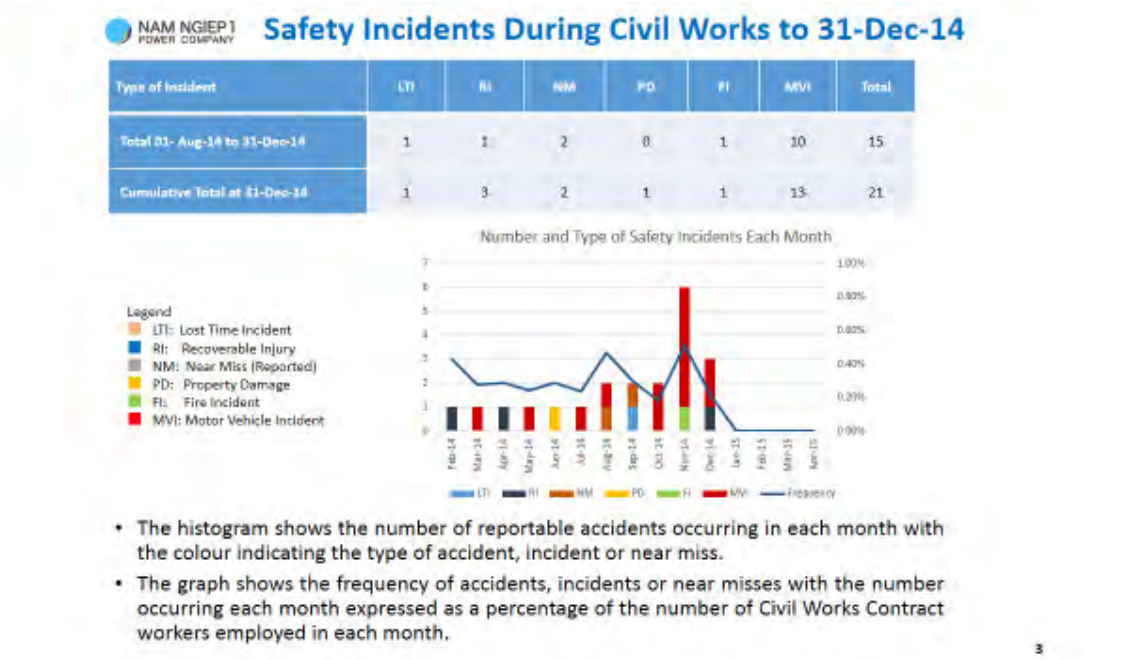
Incidents are classified by the Project into six categories in accordance with international convention. These categories are:

FI	Fire Incident	(1)
LTI	Lost Time Incident	(1)
MVI	Motor Vehicle Incident	(13)
NM	Near Miss (Reported)	(2)
PD	Property Damage	(1)
RI	Recoverable Injury	(3)
Total		(21)

Starting in February 2014, and during the period to 31 December 2014, there have been 21 reported incidents. The distribution in number by type is shown in parenthesis above. Separating those incidents occurring before the reporting period (February to July 2014) and those during the reporting period (August to December 2014), the total reported incidents are is a 5/16 split in total.

It can be seen that by far the greatest number of incidents in any category are Motor Vehicle Incidents (13). In the 5-month reporting period, August to December 2014, there were 10 incidents and only 3 incidents in the 6 months prior to that. The main reason for the increase in MVI in the reporting period was the increasing number of access roads completed and the greater amount of traffic that the roads attracted as different parts of the construction project opened up to commence the works.

The distribution of incidents by type and over time can be seen in the histogram and graph in the illustration below. The different categories of incident and number each month are represented by different coloured blocks. The graph shows the frequency of incidents and is the number of incidents divided by the number of workers on site expressed as a percentage, plotted against time. The highest recorded number of incidents in any one month was 6 in November 2014 when the number of workers was 1177 and this also produced the greatest frequency to-date of 0.5% or 1 incident per month per 200 workers. This compares with an average over the Project to 31 December 2014 of 0.3% or 1 incident per month per 333 workers.



5.5 Reporting to the Lenders, LTA and Others on Safety Incidents and Accidents

Under the Facility Agreement signed with ADB, NNP1PC submit a detailed report of any serious and reportable accident in accordance with a timeline required by ADB. As a general rule an accident is considered serious and reportable if any injured person is detained in hospital for more than 24 hours. Under this regimen full particulars of the accident are submitted to ADB together with a corrective action plan which requires the consent of ADB to re-start the works once the corrective actions have been carried out satisfactorily. Updates of the status of corrective actions are included in the NNP1 Monthly Progress Report sent to the Lenders

The total 21 incidents recorded to 31 December any accident 2014 are tabulated below. One serious injury was sustained in the period and that was Incident No.9 on 20 September 2014 when a linesman climbed a 22 kV Distribution Line pole without following established safety procedures and was electrocuted after touching a live conductor, then falling about 10 m to the ground, sustaining broken bones and burns to one hand that resulted in amputation.

A full report was submitted to ADB in respect of Incident No.9 complete with corrective actions and these were fulfilled prior to work restarting.

NNP1PC includes data and statistics on safety incidents in their Monthly Progress Report to its shareholders, Lenders and their Technical advisors.

Table 9 list of Accidents to 31 December 2014 (Sheet 1 of 2)

NAM NGIEP1 POWER COMPANY **List of Safety Incidents to 31-Dec-14 (Sheet 1 of 2)**

S. No.	Date	Type	Description	M-M
1	24-Feb-14	RI	MVDC excavator fell over on T5 road.	233
2	24-Mar-14	MVI	Collision of MVDC truck with Owner car.	358
3	07-Apr-14	RI	Collision of bike rider with MVDC truck.	348
4	05-May-14	MVI	Collision of MVDC truck with TCM car.	409
5	06-Jun-14	PD	Fly rock from blast fell on local houses.	345
6	27-Jul-14	MVI	SECC crane fell over as passing excavator.	418
7	02-Aug-14	NM	Ferry tug lost from mooring in flood.	426
8	11-Aug-14	MVI	MVDC truck overturned.	
9	20-Sep-14	LTI	ASA linesman fell from pole after shock.	671
10	26-Sep-14	NM	Large rock fell down slope on equipment	
11	15-Oct-14	MVI	Water tanker overturned on Road P2	1096
12	23-Oct-14	MVI	RT truck fell from Road T13 after failure.	
13	01-Nov-14	MVI	RT truck engine/brake failure on slope.	1177
14	08-Nov-14	MVI	External concrete truck overturned.	
15	19-Nov-14	FI	Unoccupied/rented village house fire.	
16	23-Nov-14	MVI	SECC crane engine fire.	
17	25-Nov-14	MVI	RT pick-up fell over on Road A	
18	26-Nov-14	MVI	RT dump truck brake failure on Road P1	

Table 10 list of Accidents to 31 December 2014 (Sheet 2 of 2)

S. No.	Date	Type	M-M
19	15 December 14	MVI	SD5 excavator fell over at disposal area
20	17 December 14	MVI	RT articulated truck engine failure
21	18 December 14	RI	PKC scaffolding collapse at box culvert

In accordance with its Company Procedures, the Civil Contractor, Obayashi Corporation, provides a summary report of safety incidents that occurred during the month and statistical analysis of safety performance such as lost time in each Monthly Progress Report which is circulated to NNP1PC, its Lenders and their Technical Advisors. The summary provided by the Civil Contractor in their December 2014 Report is extracted and provided below.

- Total working hours until this end of last month 1,345,608 hours
- Total working hours in this month: 316,546 hours
- Total working hours until the end of this month 1,662,154 hours
- Total working hours without accident 858,605 hours
- Number of Loss Day 103 days
- Performance parameters.

Accident Frequency = 0.60, Accident Severity Rate = 61.67 Contractor Compliance Management

6 APPENDIX: ENVIRONMENTAL MONITORING RESULTS

a. DECEMBER 2014 WATER QUALITY MONITORING RESULTS

Result of construction area discharge monitoring during December 2014.

	Site Name	Regulating Dam
	Station Code	DS08
	Date	18/12/14
Parameter	Guideline	
pH	6.0 - 9.0	7.94
Sat. DO (%)		71.3
DO (mg/L)		5.91
Conductivity (µs/cm)		382
TDS (mg/L)		191
Temperature		22.98
Turbidity (NTU)		80.4
TSS (mg/L)	<50	67.50
Oil & Grease (mg/L)	<10	ND

Result of Effluent discharge monitoring during December 2014.

	Site Name	TCM camp	MVDC Camp	RT Camp
	Station code	EF03	EF04	EF05
	Date	18/12/14	18/12/14	18/12/14
Parameter	Guideline			
pH	6.0 - 9.0	6.95		8.13
Sat. DO (%)		9.4		78.3
DO (mg/L)		0.81		6.44
Conductivity (µs/cm)		421		182
TDS (mg/L)		210		91
Temperature		20.96		24.23
Turbidity (NTU)		108.9	No	130
TSS (mg/L)	<50	72.00	discharge.	151.00
Iron (mg/L)	<2.0	2.122		2.679
Manganese (mg/L)	-	0.128		0.068
Ammonia (mg/L)	<10	3.45		0.52
BOD (mg/L)	<30	80		9
COD (mg/L)	<125	187.55		44.53
Oil & Grease (mg/L)	<10	13.8		4.52
Total coliform (MPN/100ml	<400	3,500		9,200

Result of Groundwater monitoring during December 2014.

	Site Name	Ban Hatsaykham		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	17/12/14	17/12/14	17/12/14
Parameter	Guideline			
pH	6.5-9.0	6.00	5.81	5.84
Sat. DO (%)	-	26.5	34.5	31.7
DO (mg/L)	-	2.12	2.72	2.52
Conductivity (µs/cm)	-	262	297	358
TDS (mg/L)	<1,200	131	149	179
Temperature	-	25.91	26.79	26.29
Turbidity (NTU)	<20	0	0.47	0.19
Arsenic (mg/L)	<0.05	<0.0003	<0.0003	<0.0003
Cadmium (mg/L)	<0.01	<0.0003	<0.0003	<0.0003
Calcium (mg/L)	-	15.580	12.290	18.500
Iron (mg/L)	<1.0	0.016	0.071	0.037
Magnesium (mg/L)	-	1.184	<1.000	1.117
Manganese (mg/L)	<0.5	<0.010	<0.010	0.013
Potassium (mg/L)	-	<1.00	<1.00	<1.00
Sodium (mg/L)	-	<1.00	<1.00	<1.00
Fluoride (mg/L)	<1.0	<0.20	<0.20	<0.20
Nitrate (mg/L)	<45	<0.05	0.25	<0.05
Nitrite (mg/L)	-	<0.05	<0.05	<0.05
Total Hardness (mg/L)	<500	43.5	40	50.5
Total coliform (MPN/100ml)	<2.2	0	0	0
Fecal coliform (MPN/100ml)	0	0	0	0
E.coli (MPN/100mL)	0	0	0	0

Result of Surface water monitoring during December 2014.

	Site Name	Nam Ngiep River									Nam Chain	Nam Phouan	Nam Xao
	Station Code	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
	Date	15/12/1	16/12/14	16/12/14	17/12/14						15/12/14	16/12/14	17/12/14
Parameter	Guideline												
pH	5.0 - 9.0	7.86	7.96	8.01	8.18	8.48	8.54	8.32	8.09	7.63	7.43	7.87	8.15
DO (%)	-	105.7	98.5	100.8	104.6	103.5	108.2	111.7	68.4	83	113.9	103.6	107.2
DO (mg/L)	>6.0	9.73	8.75	9.03	9.45	9.29	9.61	9.88	7.92	7.29	10.8	9.41	9.44
Conductivity (µs/cm)	-	215	218	340	154	262	197	139	114	151	79	142	233
TDS (mg/L)	-	107	109	170	77	131	98	69	57	75	39	71	117
Temperature (°C)	-	17.52	19.79	19.42	19.57	19.98	20.6	20.7	21.09	20.62	15.96	18.72	20.95
Turbidity (NTU)	-	19.6	21	13.1	11.9	12.6	14	18.4	14.6	12.9	81	7.5	6
Arsenic (mg/L)	<0.01	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001	0.001	<0.0005
Calcium (mg/L)	-	15.450	13.770	12.482	12.620	12.550	13.640	14.560	12.720	12.500	4.57	10.030	15.580
Iron (mg/L)	-	1.085	0.854	0.487	0.528	0.529	0.482	0.643	0.603	0.501	1.696	0.373	0.425
Lead (mg/L)	<0.05	0.001	0.002	<0.001	<0.001	<0.001	0.002	0.002	0.001	0.001	0.007	<0.001	<0.001
Magnesium (mg/L)	-	3.194	2.658	2.383	2.344	2.384	2.381	2.551	2.417	2.381	1.025	1.262	4.056
Manganese (mg/L)	<1.0	0.053	0.044	0.037	0.040	0.038	0.043	0.043	0.042	0.040	0.073	0.045	0.047
Mercury (mg/L)	<0.002	<0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Potassium (mg/L)	-	1.089	1.005	<1.00	<1.00	<1.00	<1.00	1.089	<1.00	<1.00	1.159	1.118	<1.00
Sodium (mg/L)	-	2.887	2.869	2.754	2.702	2.749	2.821	3.132	2.837	2.899	1.025	<1.00	4.585
Total coliform (MPN/100mL)	<5,000	920	540	350	350	540	170	350	350	350	240	540	220
Ammonia-Nitrogen (mg/L)	<0.2	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10
BOD (mg/L)	<1.5	<1	<1	<1	1	1	2	<1	1	1	<1	<1	1

COD (mg/L)	<5.0	15.90	ND	ND	ND	ND	28.62	12.72	ND	ND	ND	ND	ND
Chloride (mg/L)	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Nitrate-Nitrogen (mg/L)	<0.2	<0.05	<0.05	0.08	0.07	<0.05	0.08	<0.05	<0.05	0.06	0.08	0.10	<0.05
Sulfate (mg/L)	<500	1.18	1.59	6.92	2.22	1.92	1.67	2.30	2.36	0.96	8.84	0.66	0.68
Total Alkalinity (mg/L)	-	67.84	59.80	57.79	50.25	53.77	49.25	56.78	54.78	55.28	28.14	43.72	73.37
TSS (mg/L)	-	33.20	20.00	13.00	12.00	11.33	14.40	14.73	13.54	14.27	47.84	10.30	<10.00

b. NOVEMBER 2014 WATER QUALITY MONITORING RESULTS

Result of construction area discharge during November 2014.

	Site Name	Regulating Dam
	Station code	DS08
	Date	20/11/14
Parameter	Guideline	
pH	6.0 - 9.0	7.73
Sat. DO (%)		74.6
DO (mg/L)		5.94
Conductivity (µs/cm)		328
TDS (mg/L)		164
Temperature		25.94
Turbidity (NTU)		261
TSS (mg/L)	<50	361.5
Oil & Grease (mg/L)	<10	2

Result of Effluent discharge monitoring during November 2014.

	Site Name	TCM camp	MVDC Camp
	Station code	EF03	EF04
	Date	20/11/14	20/11/14
Parameter	Guideline		
pH		6.7	7.8
Sat. DO (%)		-	24.5
DO (mg/L)		3.1	2.03
Conductivity (µs/cm)		386	649
TDS (mg/L)		-	324
Temperature		23.2	23.58
Turbidity (NTU)		101.6	133
TSS (mg/L)	<50	102	44
Ammonia (NH_3)	<10	6	3.42
BOD	30	156	41
COD	125	252	94.4
Oil & Grease	<10	0.312	11.94
Total coliform (MPN/100ml	<400	320,000	540,000

Result of groundwater quality monitoring during November 2014

	Site Name	Ban Hatsaykham		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	20/11/2014		
Parameter	Guideline			
pH	6.5-9.0	5.91	No sample was taken. Due to the pump broken.	No sample was taken. Due to the pump broken.
Sat. DO (%)		38.1		
DO (mg/L)		3.01		
Conductivity (µs/cm)		97		
TDS (mg/L)	<1,200	48		
Temperature		26.42		
Turbidity (NTU)	<20	0.04		
Total coliform(MPN/100ml	<2.2	23		
Fecal coliform(MPN/100ml)	0	1.1		
E.coli	0	ND		

Result of surface water quality monitoring during November 2014.

	Site	Nam Ngiep River										Nam	Nam	Nam Xao
	Station	NNG01	NNG02	NNG03	NNG09	NNG10	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
	Date	17/11/14	18/11/14	18/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	17/11/14	18/11/14	19/11/14
Parameter	Guideline													
pH	5.0-9.0	7.71	7.78	7.73	7.94	8.21	8.22	8.43	7.6	8.07	7.5	7.54	8.02	7.1
DO (%)		87.1	93.9	93.7	97	90.9	97.5	98	-	97.6	91.1	90.9	95.1	108.1
DO (mg/L)	>6.0	7.35	7.73	7.77	8.2	7.89	8.19	8.0	7.0	8.03	7.48	7.89	8.13	9.3
Conductivity(µs/cm)		122	108	103	105	104	110	97	84	126	111	46	87	12.8
TDS (mg/L)		61	54	51	53	52	55	49	42	63	56	23	44	-
Temperature (°C)		21.9	23.83	23.52	22.74	22.87	23.45	25.08	20.07	24.46	24.5	20.29	21.99	21.2
Turbidity (NTU)		31.2	20	21.3	20	18.7	18.6	17	36	16.7	19.7	4.92	5.62	4.16
TSS (mg/L)		35.5	22.75	26	24.4	-	22.4	14	23.33	28.13	25	19.75	14.8	<10

	Site	Nam Ngiep River										Nam	Nam	Nam Xao
	Station	NNG01	NNG02	NNG03	NNG09	NNG10	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
	Date	17/11/14	18/11/14	18/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	19/11/14	17/11/14	18/11/14	19/11/14
Parameter	Guideline													
NO3-N (mg/L)	<5.0	0.11	<0.1	0.13	0.1	-	0.12	0.14	<0.1	0.1	<0.1	0.12	<0.1	<0.1
NH3-N (mg/L)	<0.2	<05	ND	<0.5	ND	-	ND	<0.5	ND	<0.5	ND	ND	<0.5	<0.5
Total Iron (mg/L)		2.076	1.398	1.384	0.920	-	1.183	0.895	1.078	1.250	0.594	0.557	0.716	1.290
COD (mg/L)	<5.5	14.42	11.22	14.42	ND	-	ND	ND	11.22	ND	14.42	17.64	11.22	ND
BOD (mg/L)	<1.5	<1	<1	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.1	<0.5
Manganese (mg/L)	<1	0.076	0.069	0.067	0.054	-	0.065	0.046	0.059	0.064	0.054	0.039	0.072	0.064
Total coliform	<5,000	920	160	92	540	920	1,600	5,400	490	920	1,600	540	120	

c. OCTOBER 2014 WATER QUALITY MONITORING RESULTS

Result of groundwater quality monitoring during October 2014.

	Site Name	Ban Hatsaykham		
	Station code	GHSK01	GHSK02	GHSK03
	Date	31/10/14	31/10/14	31/10/14
	Guideline			
pH	6.5-9.0	6.19	5.86	5.82
Conductivity (µs/cm)		96	89	100
TDS (mg/L)	<1200	48	45	50
Turbidity (NTU)	<20	2.08	1.2	1.08
Total coliform (MPN/100ml	<2.2	9.2	5.1	<1.1
Fecal coliform (MPN/100ml)	0	ND	ND	ND

Result of surface water quality monitoring during October 2014.

	Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
	Station code	NNG01	NNG02	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
	Date	29/10/14	30/10/14	31/10/14	31/10/14	31/10/14	31/10/14	31/10/14	31/10/14	29/10/14	30/10/14	31/10/14
	Guideline											
pH	5.0 - 9.0	7.76	7.66	7.86	7.96	8	8.52	7.64	8.47	7.49	7.71	8.3
DO (%)		88.8	65.6	104.1	92.8	102.5	104.9	160.6	96.3	123	90.1	91.1
DO (mg/L)	>6.0	7.46	5.24	8.38	7.46	8.13	8.37	12.57	7.56	9.94	6.66	7.05
Conductivity (µs/cm)		118	99	96	95	95	96	80	97	38	81	129
TDS (mg/L)		59	50	48	48	47	48	40	49	19	40	65
Temperature (°C)		23.1	24.87	24.98	25.26	26.14	25.93	26	26.8	22.28	22.85	27.63
Turbidity (NTU)		6.82	5.86	5.66	8.14	7.14	5.62	9.26	6.32	4.92	5.62	4.16

TSS (mg/L)		71	131	111.5	86	106.25	100.25	227	54	23.4	41.67	<10
NO3-N (mg/L)	<5.0	0.11	0.1	0.11	0.11	0.11	0.12	0.14	0.11	<0.10	0.11	<0.1
NH3-N (mg/L)	<0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total iron (mg/L)		2.863	4.903	3.379	2.943	3.306	4.552	7.316	2.173	0.873	1.246	0.725
COD (mg/L)	<5.5	15.9	19.08	19.08	24	28.62	15.9	19.08	ND	12.72	15.9	ND
BOD (mg/L)	<1.5	2	<0.5	1	1	1	<0.5	1	<0.5	2	<0.5	1
Manganese (mg/L)	<1	0.103	0.179	0.134	0.119	0.126	0.13	0.194	0.084	0.03	0.107	0.058
Total coliform (MPN/ 100ml)	<5,000	2,400	920	350	1,600	350	350	920	1,600	540	920	220

d. SEPTEMBER 2014 WATER QUALITY MONITORING RESULTS

Result of Effluent discharge monitoring during September 2014.

		Site Name	TCM Camp
		Station	EF03
		Date	29-Sep-14
		Time	9:46
Parameter	Unit	Guideline	
pH	-	6.0-9.0	7.45
PDO	%	-	
DO	mg/L	-	0.17
Conductivity	µS/cm	-	475
TDS	mg/L	-	237
Temperature	°C	-	30.23
Turbidity	NTU	-	170
BOD	mg/L	30	156
COD	mg/L	125	252
TSS	mg/L	-	102
Ammonia-Nitrogen	mg/L	10	6

Oil & Grease	mg/L	10	23
Manganese	mg/L	-	0.324
Total Iron	mg/L	-	3.48
Fecal Coliform	MPN/100mL	-	160,000

Result of groundwater quality monitoring during September 2014

		Site Name	Ban Hatsaykham		
		Station	GHSK01	GHSK02	GHSK03
		Date	29-Sep-14	29-Sep-14	29-Sep-14
		Time	9:00	9:11	9:20
Parameter	Unit	Guideline			
pH	-	6.5 - 9.2	6.03	5.66	5.19
PDO	%	-	51.7	41.3	39.2
DO	mg/L	-	3.9	3.07	3.05
Conductivity	µS/cm	-	68	56	248
TDS	mg/L	<1,200	34	28	122
Temperature	°C	-	27.3	28.69	27.13
Turbidity	NTU	<20	ND	ND	ND

Fecal Coliform	MPN/100mL	<2.2	<1.8	<1.8	<1.8
E.coli	MPN/100mL	0	0	0	0

Result of surface water quality monitoring during September 2014.

		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
pH	-	5.0 - 9.0	7.62	7.62	7.53	7.42	7.85	7.7	7.71	7.62	7.48	7.82	7.98
PDO	%	-	94.2	95.7	94.1	98.7	85.1	82.2	80.3	93.4	102.9	103.1	88.2
DO	mg/L	>6.0	7.76	7.76	7.62	8.05	6.83	6.53	6.55	7.43	8.56	8.43	6.85
Conductivity	µS/cm	-	96	81	80	65	73	71	75	81	37	78	104

		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
TDS	mg/L	-	48	41	40	33	37	35	37	41	18	39	53
Temperature	°C	-	22.93	24.34	24.51	24.67	27.35	25.64	26.27	26.02	22.3	24.02	27.11
Turbidity	NTU	-	250	2000	400	2200	1800	1200	1800	160	55	130	25
BOD	mg/L	<1.5	ND	1.1	ND	1.8	1.1	1.1	1	ND	ND	ND	ND
COD	mg/L	<5.0	ND	48	ND	93.6	55.8	48.2	50	ND	ND	ND	ND

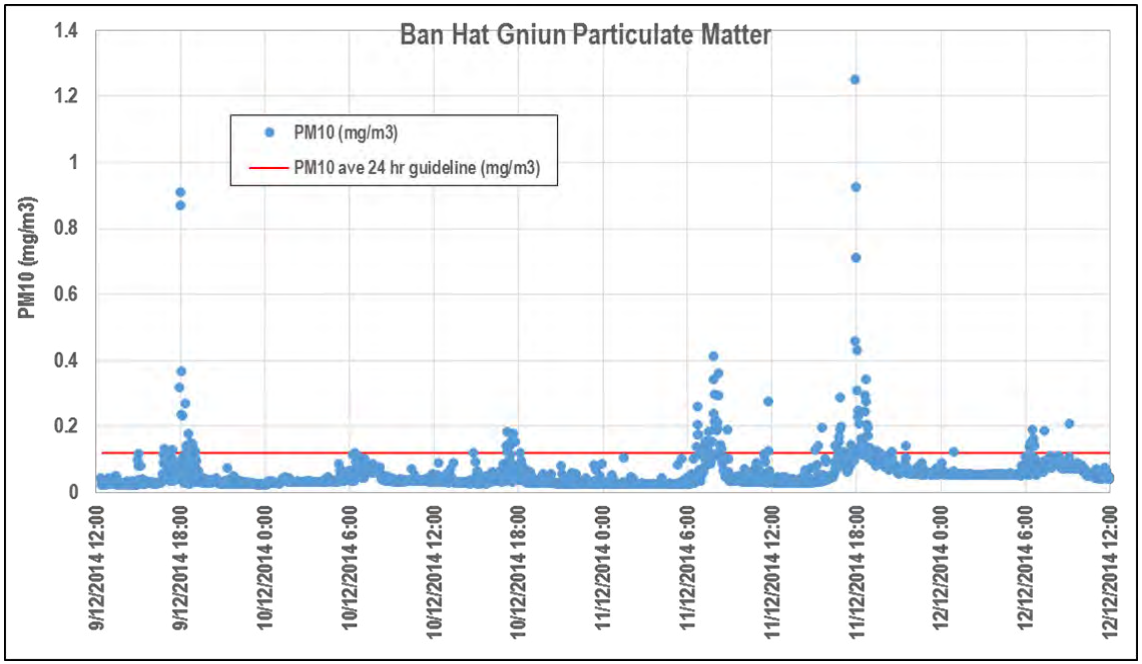
		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
TSS	mg/L	-	198	1,127	362	1,756	1,101	970	1,341	161	67.4	120	13.5
Ammonia-Nitrogen	mg/L	<0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-Nitrogen	mg/L	<5.0	0.12	0.16	0.14	0.15	0.15	0.15	0.15	0.15	0.13	0.11	0.15
TKN	mg/L	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.5	ND
Chloride	mg/L	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5

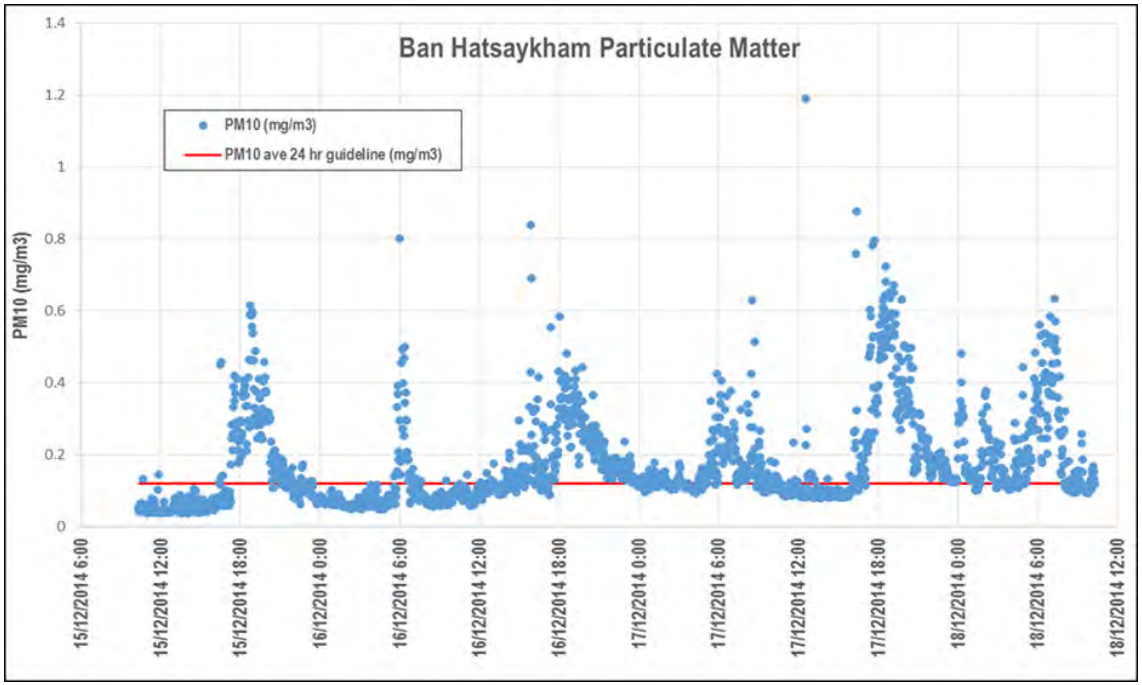
		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
Sulphate	mg/L	<500	2.9	3.6	2.7	3.3	3	3.1	4	2.9	1.5	3.3	1.8
Alkalinity	mg/L	-	47.3	35.9	36.3	27.7	26.9	29.8	30.2	38.4	18.4	35.3	45.7
Arsenic	mg/L	<0.01	0.0023	0.014	0.0035	0.007	0.0049	0.0045	0.0047	0.0015	0.0009	0.0006	ND
Calcium	mg/L	-	9.29	9.66	7.12	6.45	6.24	6.29	6.96	6.21	2.63	7.41	6.22
Manganese	mg/L	<1.0	0.163	1.22	0.245	0.882	0.865	0.735	0.99	0.129	0.054	0.162	0.053

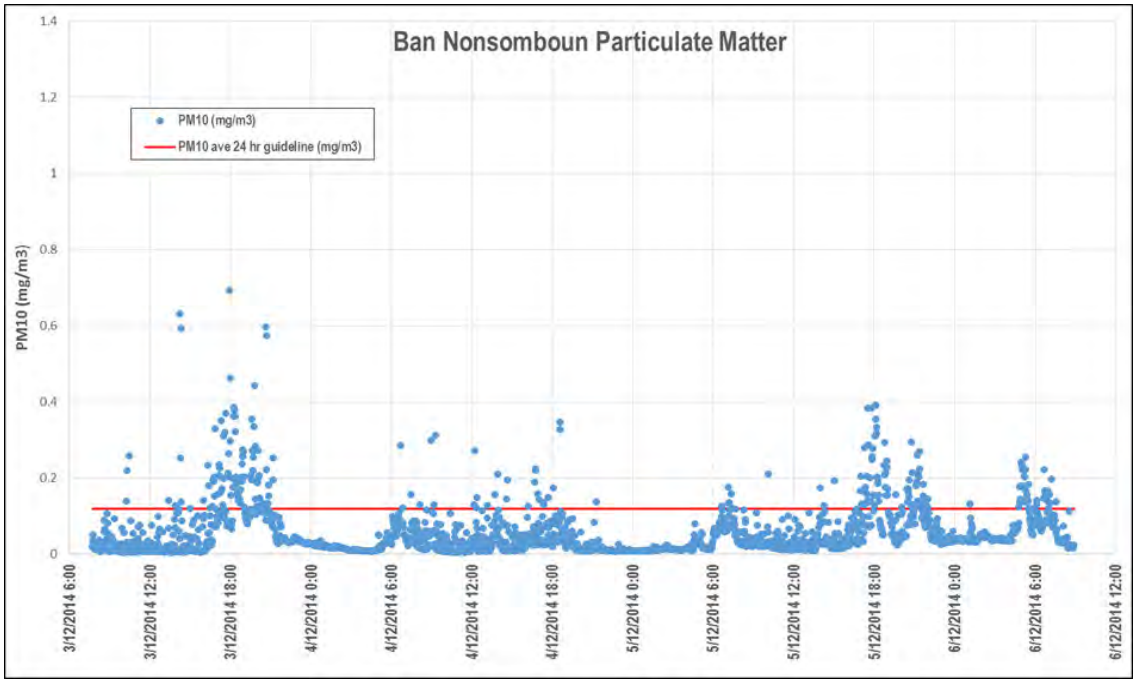
		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
Mercury	mg/L	<0.002	0.0008	0.0003	0.0009	0.001	0.0006	0.001	0.0009	0.001	0.0005	0.001	0.001
Magnesium	mg/L	-	3.19	6.66	3.02	4.73	3.21	3.66	4.51	1.95	1.05	1.43	2.66
Lead	mg/L	<0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/L	-	1.97	6.38	2.14	6.68	3.62	4.3	5.9	1.44	1.26	1.9	0.512
Sodium	mg/L	-	2.06	2.13	3.4	1.66	1.48	1.87	1.79	1.54	1.42	1.59	2.39

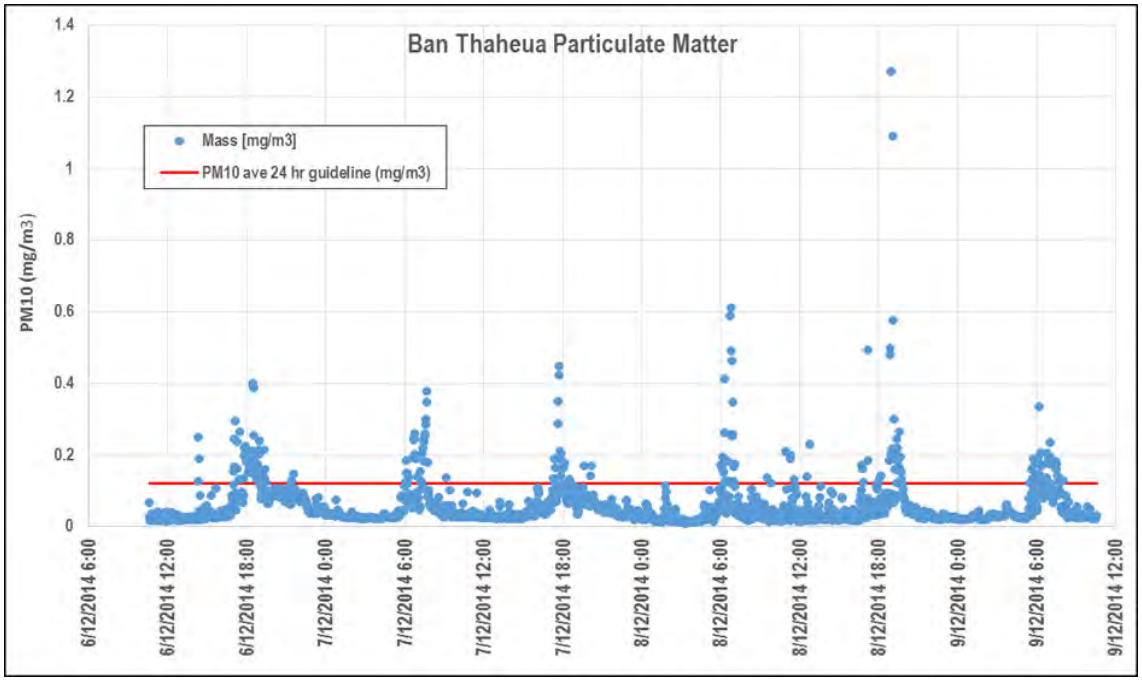
		Site Name	Nam Ngiep								Nam Chian	Nam Phouan	Nam Xao
		Station	NNG01	NNG02	NNG03	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
		Date	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14	30/9/14
		Time	7:04	10:30	9:00	8:35	10:12	11:20	12:40	13:20	8:34	11:00	10:50
Parameter	Unit	Guideline											
Total Iron	mg/L	-	9.35	80	13.9	95.2	92.1	93.4	26	8.25	2.46	4.24	0.982
Fecal Coliform	MPN/100mL	<1,000	230	3,300	1,700	92,000	2,200	3,300	2,200	2,300	490	7,900	7,900

AIR QUALITY MONITORING RESULTS

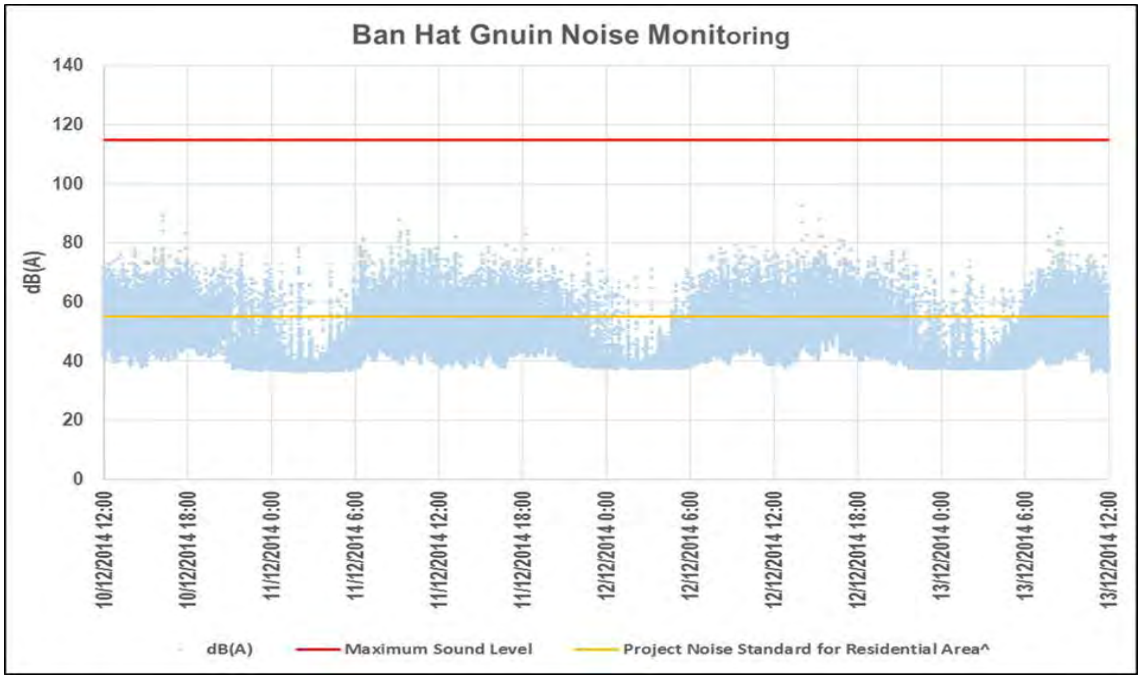


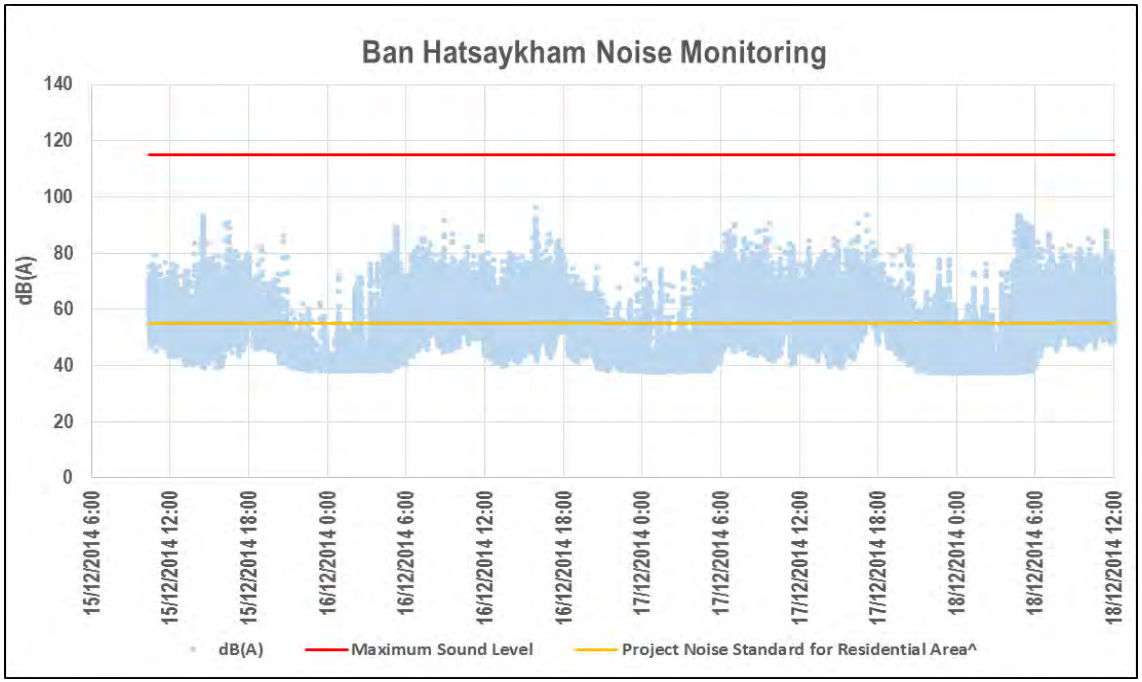

Ban Hatsaykham Particulate Matter
PM10 (mg/m3)
PM10 ave 24 hr guideline (mg/m3)
PM10 (mg/m3)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
15/12/2014 6:00
15/12/2014 12:00
15/12/2014 18:00
16/12/2014 0:00
16/12/2014 6:00
16/12/2014 12:00
16/12/2014 18:00
17/12/2014 0:00
17/12/2014 6:00
17/12/2014 12:00
17/12/2014 18:00
18/12/2014 0:00
18/12/2014 6:00
18/12/2014 12:00

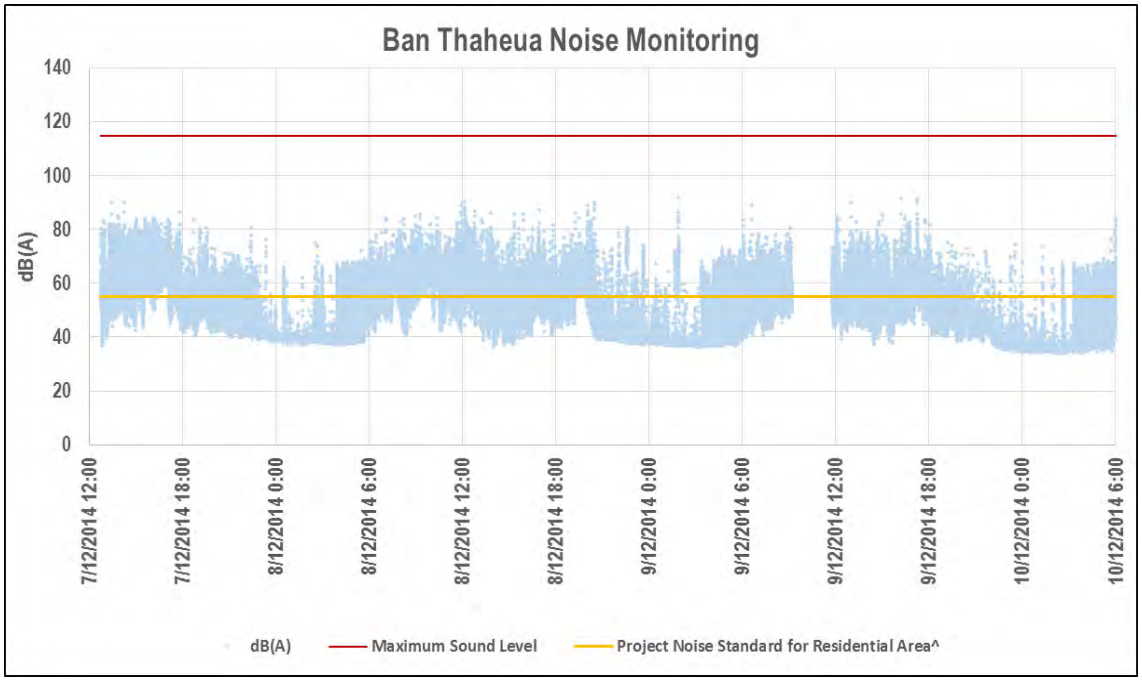

Ban Nonsomboun Particulate Matter
PM10 (mg/m3)
PM10 ave 24 hr guideline (mg/m3)
PM10 (mg/m3)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
3/12/2014 6:00
3/12/2014 12:00
3/12/2014 18:00
4/12/2014 0:00
4/12/2014 6:00
4/12/2014 12:00
4/12/2014 18:00
5/12/2014 0:00
5/12/2014 6:00
5/12/2014 12:00
5/12/2014 18:00
6/12/2014 0:00
6/12/2014 6:00
6/12/2014 12:00


Ban Thaheua Particulate Matter
Mass [mg/m3]
PM10 ave 24 hr guideline (mg/m3)
PM10 (mg/m3)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
6/12/2014 6:00
6/12/2014 12:00
6/12/2014 18:00
7/12/2014 0:00
7/12/2014 6:00
7/12/2014 12:00
7/12/2014 18:00
8/12/2014 0:00
8/12/2014 6:00
8/12/2014 12:00
8/12/2014 18:00
9/12/2014 0:00
9/12/2014 6:00
9/12/2014 12:00

NOISE LEVEL MONITORING RESULTS




Ban Hatsaykham Noise Monitoring
140
120
100
80
60
40
20
0
dB(A)
15/12/2014 6:00
15/12/2014 12:00
15/12/2014 18:00
16/12/2014 0:00
16/12/2014 6:00
16/12/2014 12:00
16/12/2014 18:00
17/12/2014 0:00
17/12/2014 6:00
17/12/2014 12:00
17/12/2014 18:00
18/12/2014 0:00
18/12/2014 6:00
18/12/2014 12:00
dB(A)
Maximum Sound Level
Project Noise Standard for Residential Area^


Ban Thaheua Noise Monitoring
140
120
100
80
60
40
20
0
dB(A)
7/12/2014 12:00
7/12/2014 18:00
8/12/2014 0:00
8/12/2014 6:00
8/12/2014 12:00
8/12/2014 18:00
9/12/2014 0:00
9/12/2014 6:00
9/12/2014 12:00
9/12/2014 18:00
10/12/2014 0:00
10/12/2014 6:00
dB(A)
Maximum Sound Level
Project Noise Standard for Residential Area^

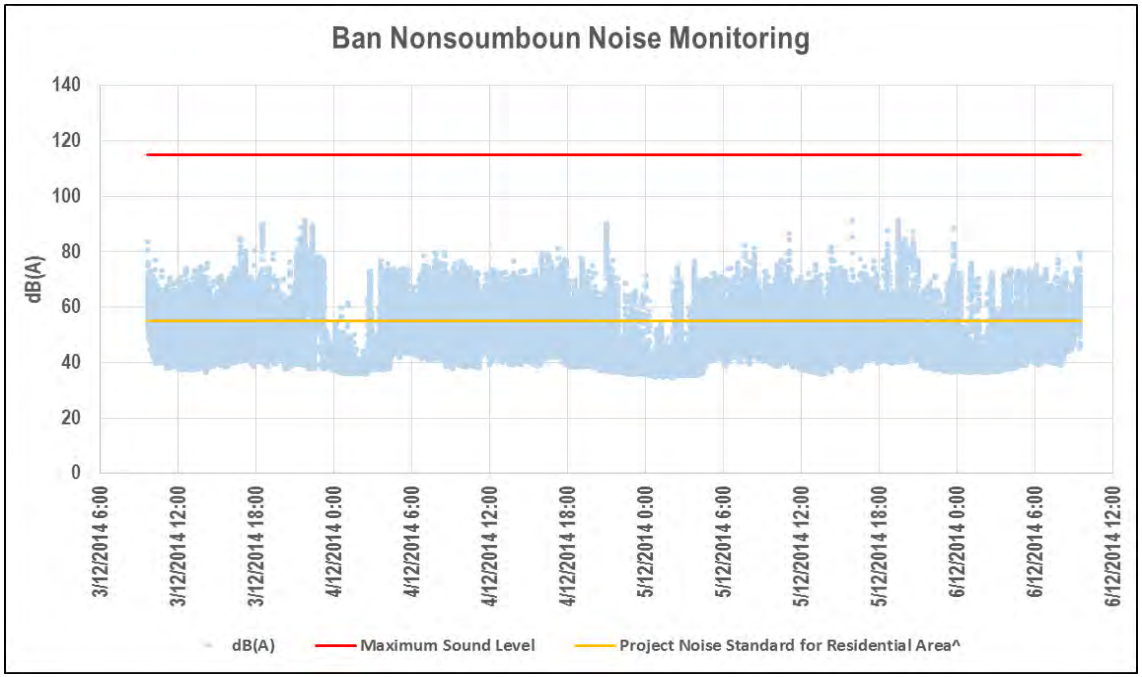

Ban Nonsoumboun Noise Monitoring
140
120
100
80
60
40
20
0
dB(A)
3/12/2014 6:00
3/12/2014 12:00
3/12/2014 18:00
4/12/2014 0:00
4/12/2014 6:00
4/12/2014 12:00
4/12/2014 18:00
5/12/2014 0:00
5/12/2014 6:00
5/12/2014 12:00
5/12/2014 18:00
6/12/2014 0:00
6/12/2014 6:00
6/12/2014 12:00
dB(A)
Maximum Sound Level
Project Noise Standard for Residential Area^

Table 11 HazMat Audit update as December 2014

Site		PKC – Workshop	PKC Fuel station and storage	TCM Fuel station	TCM HazMat Storage	TCM Explosive magazine	MVDC Parking area
Hazardous Materials Stored		Used oil; Batteries; Cooking gas; Oxygen	Used oil Petrol	Petrol	Used batteries; Used oil	Explosive materials	Used oil
1	Floor of storage area is impervious	√	√	√	√	√	√
2	Fully bunded with capacity >120% of combined container capacity	NO	√	√	√	NA	NO
3	Bunds in adequate condition	√	√	√	√	NA	√
4	Closed storage protected from rainfall	√	√	√	√	√	√
5	Storage area is well ventilated	√	√	√	√	√	√
5	Access restricted with fence and lock	NA	√	√	√	√	NO
6	Restricted access signs outside facility	NA	NO	NO	NO	√	NO
7	Standard procedures for introduction of new substances to storage area	NA	NO	NO	NO	NO	NO
8	Incompatible hazardous materials and chemicals stored separately	√	√	NA	√	√	√
9	Explosives stored in underground facilities or in appropriate bunding	NA	NA	NA	NA	NA	NA
10	Explosive storage facilities are locked and access is restricted	NA	NA	NA	NA	√	NA
11	HazMat Register up-to-date	NO	?	?	?	?	?
Containers							
1	Containers leak-proof and in good condition	√	NO	√	√	√	√
2	Metallic (Iron) containers without corrosion (rust)	√	NO	√	√	√	√
3	Container chemically compatible with material stored	√	√	√	NO	√	√
4	Container closed unless material added or used	√	√	√	NO	√	√

Site		PKC – Workshop	PKC Fuel station and storage	TCM Fuel station	TCM HazMat Storage	TCM Explosive magazine	MVDC Parking area
5	Stored above flood level	√	√	√	√	√	√
Labels							
1	Display of labels with words “Hazardous product/waste”	NO	NO	NO	NO	√	NO
2	Label describes content	√	√	NO	√	NO	√
3	Label describes hazards for users	NO	√	NO	√	NO	√
4	For waste, label provides initial accumulation date	NO	NO	NO	NO	NA	NO
5	MSDS sheets readily accessible	√	√	√	NO	NO	√
Safety							
1	Procedures for HazMat handling posted within premises	NO	NO	NO	NO	NO	NO
2	Procedures for emergency response posted within premises	NO	NO	NO	NO	NO	NO
3	Areas/tasks designated for use of PPE clearly marked/signed	√	NO	√	NO	√	NO
4	PPE available on site and in good repair	NO	NO	NO	NO	NO	NO
5	Staff trained for HazMat handling and spill response	NO	√	√	√	NO	√
6	Fire fighting equipment available and controlled	√	√	√	NO	√	√
7	Fire fighting equipment is sited appropriately for ease of access	√	√	√	NO	√	√
Spill response							
1	Spill response kits readily available with adequate supply	√	NO	NO	NO	NA	√
2	Drainage water quality monitoring shows no pollution	NO / NA	NO / NA	NO / NA	NO / NA	NA	NO / NA
3	Register of training for spill response and fire fighting up-to-date	NO	NO	NO	NO	NA	?
4	Safe storage is provided for contaminated materials after spill response	√	NO	√	NO	NA	√
5	Plan is in place for removal and final disposal of contaminated materials	√	√	√	√	NA	√
6	Access to water in close proximity to the storage area	NO	NO	√	NO	NA	NO
Documentation							

Site		PKC – Workshop	PKC Fuel station and storage	TCM Fuel station	TCM HazMat Storage	TCM Explosive magazine	MVDC Parking area
1	HazMat Register	√	√	√	√	√	√
2	HazMat Manual with SOP's and emergency procedures	NO	NO	√	√	√	NO
3	Training register for HazMat handling and emergency response	NO	NO	√	√	NO	√
4	Explosives log book	NA	NA	NA	NA	√	NA
5	HazMat transport register	√	√	√	√	√	√
Fuel Use							
1	Refuelling equipment without leakages observed	NA	√	√	NA	NA	NA
2	Safety signs and posters posted and visible	NA	√	√	NA	NA	NA
3	Staff trained for refuelling and spill response	NA	√	√	NA	NA	NA
4	Refuelling procedure enforced	NA	NO	NO	NA	NA	NA
5	Presence of spill response kits	NA	NO	NO	NA	NA	NA
6	Fire-fighting equipment available and maintained	NA	√	√	NA	NA	NA
7	Movements of fuel detailed in up-dated register	NA	√	√	NA	NA	NA

Table 12 Sub-Contractor list and related activities

Subcontracting Status

As of 31st December 2014

No.	Company Name	Work Scope	Status	Submission		Owner's Reply		Remarks
				Ref.	Date	Ref.	Date	
1. ROAD WORKS								
1-1	Phoukhong Construction Sole Company (PKC)	Setting out survey	approved	NNP1-PCL-00221	17-Apr-14	NNP1/0126-014	05-May-14	
		Improvement of JICA road						
		Construction of Road A, T8, P1 (Box Culvert)						
		Construction of Temporary Bridge						
1-2	Lao Global Engineering Consultant Co., Ltd.	Setting out survey	less than criteria	N/A		N/A		
1-3	TPEC Company	Setting out survey	less than criteria	N/A		N/A		
1-4	TCM Engineering Co.,Ltd.	Setting out survey	approved (CWC)	N/A		N/A		
		Construction of road P1,P2,T1,T2,T4,T7,T8,T9,T10,T11 & T13						
1-5	Meuang Vang Development Co.,Ltd (MVDC)	Construction of Road A,P1,T5,T12	approved	NNP1-PCL-00220	17-Apr-14	NNP1/0126-014	05-May-14	
1-6	State Enterprise of Communication Construction (SECC)	Construction of Temporary Bridge	less than criteria	N/A		N/A		
1-7	Lamsei Road and Bridge Construction Co.,Ltd	Excavation of Boroow Pit No.3	less than criteria	NNP1-PCL-00102	30-Jan-14	N/A		
1-8	BK Construction	Pipe Culvert	less than criteria	N/A		N/A		
2. MAIN DAM								
2-1	TCM Engineering Co.,Ltd.	Site Clearing for survey works at Main Dam	approved (CWC)	N/A		N/A		
		Site Clearing for RCC Plant yard						
2-2	Meuang Vang Development Co.,Ltd (MVDC)	Earthworks for RCC Plant Yard	approved	NNP1-PCL-00220	17-Apr-14	NNP1/0126-014	05-May-14	
2-3	Song Da 5 Joint Stock Company	Excavation work of Main Dam	approved	NNP1-PCL-00201 NNP1-PCL-00301	04-Apr-14 20-Jun-14	NNP1/0113-014 NNP1/0181-014	05-May-14 04-Jul-14	
		RCC Production of Main Dam	approved					
		A candidate of below						
		RCC Placement of Main Dam	approved					
		Main Powerhouse structure works	approved					
2-4	SINOHYDRO & TCM Engineering Co.,Ltd. Joint Venture	Production of Aggregate, RCC and CVC	approved	NNP1-PCL-00222 NNP1-PCL-00330	17-Apr-2014 22-Jul-2014	NNP1/0113-014 NNP1/0199-014	05-May-14 23-Jul-14	
		A candidate of below						
		Main Powerhouse structure works	approved					

Subcontracting Status

As of 31st December 2014

No.	Company Name	Work Scope	Status	Submission		Owner's Reply		Remarks
				Ref.	Date	Ref.	Date	
2-5	Right Tunneling Co., LTD.	Diversion tunnel works including inlet and outlet	approved	NNP1-PCL-00198	05-Apr-14	NNP1/0113-014	05-May-14	
2-6	Vientiane Consultant Company	Setting-out Survey for Main Dam	less tha criteria	N/A		N/A		
2-7	V & K Concrete Sole Co., Ltd	Production& Supplying of Ordinary Concrete	approved	NNP1-PCL-00287	11-Jun-14	NNP1/0176-014	26-Jun-14	
3. RE-REGULATION DAM								
3-1	Song Da 5 Joint Stock Company	Re-regulation dam structure works	approved	NNP1-PCL-00201 NNP1-PCL-00301	04-Apr-14 20-Jun-14	NNP1/0113-014 NNP1/0181-014	05-May-14 04-Jul-14	
4. BASE CAMP								
4-1	Meuang Vang Development Co.,Ltd (MVDC)	Earth works of the Owner's Base Camp	approved	NNP1-PCL-00220	17-Apr-14	NNP1/0126-014	05-May-14	
4-2	Pang-KeoonPhan Construction Sole Co., Ltd	Administration Office and other Building of Owner's Base Camp	approved	NNP1-PCL-00315 NNP1-PCL-00365	07-Jul-14 05-Aug-14	NNP1/0192-014 NNP1/0212-014	16-Jul-14 05-Aug-14	
5. POWER SUPPLY SYSTEM								
5-1	ASA Power Engineering Co., Ltd.	Installation of Power Supply System	approved	NNP1-PCL-00177	22-Mar-14	NNP1/0081-014	28-Mar-14	
6. OTHER S								
6-1	Lamsei Road and Bridge Construction Co.,Ltd	Earth work of the Contractor's Base Camp Earth work of the Worker's Camp No.2	less than criteria	NNP1-PCL-00102	30-Jan-14	N/A		
6-2	Phoukhong Construction Sole Company (PKC)	Construction of Contractor's Base Camp Development of Waste Disposal Area	apprived	NNP1-PCL-00221	17-Apr-14	NNP1/0216-014	5-May-14	

6.1 LIST OF PARTICIPANT OF ESMMP AWARENESS TRAINING IN NOV – DEC 2014

No	Name	Position	Section	Department
1	Ms. Ngern Punyanouvong	Maid	Admin	EMO
2	Ms. Daluny Bounyeune	Senior Environmental Monitoring Officer	Environmental Monitoring	EMO
3	Ms. Khanthaly Xayavong	Administrative Officer	Admin	EMO
4	Ms. Xongkue Pangmang	Administrative Officer	Admin	EMO
5	Ms. Vethaka Chanthone	Database Officer	EMS	EMO
6	Mr.Yengmua Palee	Senior Biodiversity Officer	Biodiversity	EMO
7	Mr. Luekang Lapao	Watershed Officer	Watershed	EMO
8	Mr. Somnhoth Phongsavath	Senior Watershed	Watershed	EMO
9	Mr. Duangdoudom Sisavath	Biodiversity Officer	Biodiversity	EMO
10	Mr. Douaher Xailiavue	Environmental Mornitoring Team Leader	Environmental monitoring	EMO
11	Mr. Khamhack Latanamety	Environmental Mornitoring Officer	Environmental monitoring	EMO
12	Mr. Vanhxay Har	Environmental Mornitoring Officer	Environmental monitoring	EMO
13	Mr. Souksavanh Thepvongsa	Support Officer	Admin	EMO
14	Mr. Manomai Sengmany	Site Management Officer	Admin	EMO
15	Mr. Air Phommaly	Driver	Admin	EMO
16	Mr. Padith Chanthaphaichit	Driver	Admin	EMO
17	Mr.Yengmua Palee	Senior Biodiversity Officer	Biodiversity	EMO
18	Mr. Phouthasone	Civil Engineer	Infrastructure	SMO

	PHONSAVATHDY			
19	Mr. Chilee	Civil Engineer	Infrastructure	SMO
20	Mr. Vylar	Architect (Design)	Infrastructure	SMO
21	Mr. Khamluang	Document Officer	CRD	SMO
22	Mr. Yangneng	Senior Officer	CRD	SMO
23	Mr. Xongmao	Senior Officer	CRD	SMO
24	Mr. Polor	Senior Officer	CRD	SMO
25	Mr.Natkritta Wongyai	Senior Officer	CRD	SMO
26	Mr. Phatthalin Wathana	Junior consultant logistic/Admin	Admin	SMO
27	Mr. Sirisompasong	Senior Consultant/Admin	Admin	SMO
28	Mr. Chanthaphone	Data Base officer	Information and Data	SMO
29	Ms. Chitthasine	Data entry Officer	Information and Data	SMO
30	Ms. Nandaly	Data entry Officer	Information and Data	SMO
31	Mr. Visouda	Junior consultant	Information and Data	SMO
32	Mr. Yia Vang	AR Consultant	Project Land	SMO
33	Mr. Sengathit	GIS officer	GIS	SMO
34	Mr. Samlet SENGDAVONG	Senior Asset Registration	Project Land	SMO
35	Mr. Khonevilay XAYAVONG	AR officer	Project Land	SMO
36	Mr. Somnuek SAYASIT	AR officer	Project Land	SMO
37	Mr. Khamphasid	AR - consultant	Project Land	SMO
38	Mr. Soubanleng	AR - consultant	Project Land	SMO
39	Mr. Yia yang	GIS - Consultant	Project Land	SMO
40	Mr. Xi Thor	AR - consultant	Project Land	SMO
41	Mr. Tongkham MANIVONG	AR - consultant	Project Land	SMO
42	Mr. Khamkhong INSOUVANH	AR - consultant	Project Land	SMO

43	Mr. Thong Lor	AR - consultant	Project Land	SMO
44	Mr. Soudavanh PHEUAPHOM	AR - consultant	Project Land	SMO
45	Mr. Khamphay KEOPHILAVONG	AR - consultant	Project Land	SMO
46	Mr. Pilot DOUCHANTHA	AR - consultant	Project Land	SMO
47	Ms. Vinanda SIPHONESAY	Chief Compensation	Project Land	SMO
48	Mrs. Latsamy LATTANAVONG	Compensation Officer	Project Land	SMO
49	Mrs. Phuangphai VANNADED	Compensation Officer	Project Land	SMO
50	Ms. Kanhchana CHANSYNA	Compensation Officer	Project Land	SMO
51	Ms. Amkha SISAVATH	Compensation Officer	Project Land	SMO
52	Mrs. Souchitta PHANTHATHILATH	Compensation Officer	Project Land	SMO
53	Mrs. Alee vue VONGPHATCHAI	Compensation - Consultant	Project Land	SMO
54	Ms. Thanaphone SOUKSAVANH	Compensation - Consultant	Project Land	SMO
55	Ms. Yermoua YONGCHUE	Compensation - Consultant	Project Land	SMO
56	Ms. Yeang KHANG	Compensation - Consultant	Project Land	SMO
57	Ms. Puaykham Xayasan	Compensation - Consultant	Project Land	SMO
58	Ms. Lattana Phommavongsa	Compensation - Consultant	Project Land	SMO
59	Ms.Nilandon Thavonsouk	Livelihood Team Leader	Livelihood	SMO
60	Mr. Sonxay Kosy	Agriculture Extension Officer	Livelihood	SMO
61	Mr. Kayyang	Livestock Officer	Livelihood	SMO
62	Mr. Yingyan	Crop Officer	Livelihood	SMO
63	Mr. Sengvilay Xiong	Forest & NTFP Officer	Livelihood	SMO
64	Mr. Sermphanh	Farm Demonstration	Livelihood	SMO

		Officer		
65	Mr. Khamkhig	Camp Follower Team Leader	Camp Follower	SMO
66	Mr. Phetsamon	Senior Office	Camp Follower	SMO
67	Mr. Southiphong	Water supply Officer	Water Supply	SMO
68	Mr. Yeamoua	Monitoring Officer	CRD	SMO
69	Ms. Thongdy	Monitoring Officer	CRD	SMO
70	Mr. Kongthong	Senior Officer 2LR	Camp Follower	SMO
71	Mr. Bounmy	Officer 2LR	Camp Follower	SMO
72	Mr. Korxong	Officer 2LR	Camp Follower	SMO
73	Mr. Kham-Ouane	Grievance Senior Officer	Project Land	SMO
74	Mr. Khambai PHANTHAVONG	Senior Agri/Irrigation Engineer	Infrastructure	SMO
75	Mr. Gerlee CHANORYIA	Senior Architect	Infrastructure	SMO
76	Ms. Kan Vongdala	HouseKeeper	SMO	SMO
77	Ms. Viengkham	HouseKeeper	SMO	SMO
78	Mr. Thongsawath KEOVICHIT	PL Team leader	Project Land	SMO
79	Ms. Somphanh	Senior Resettlement Officer	Camp Follower	SMO